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SYMPOSIUM

ON

EMERGENCY OPERATIONS

Edited by Robert C. Brictson

1 September 1966

SYSTEM

DEVELOPMENT

CORPORATION

2500 COLORADO AVE.

SANTA MONICA

CALIFORNIA
90406

This paper documents the proceedings of the
Emergency Operations Symposium held at SDC
11-13 May 1966.

Any views, conclusions, or recommendations
expressed herein are those of the various
participants. They should not be interpreted
as reflecting the views of the System Develop-
ment Corporation or the official opinion or
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PREFACE

The success of this first Symposium on Emergency Operations,
held at System Development Corporation, Santa Monica, California,
11-13 May 1966 is attributed to the cooperation, capability and
candor of the approximately one hundred participants. Special
appreciation is due to the fourteen speakers and four discussants
whose preparations reflected notable expertise and provided many
provocative insights. Despite the arbitrary division of content
into four specific panels, the breadth of perspective and diverse
experience of the attendees resulted in a forum that ranged over
the entire area of emergency operations.

To all concerned, we express our thanks for a job well done and
the hope that the publication of these proceedings will encourage
further work in emergency operations.

<div style="text-align:right">

Robert C. Brictson,
Chairman, Symposium on Emergency Operations

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EDITOR'S INTRODUCTION

The History of Disaster

The chronicles of disasters is as old as recorded history, ranging from the flood of the Gilgamesh epic in the Babylonian era through subsequent natural and man-made catastrophes, including the mass destruction of Hiroshima. Man's reactions to these terrible occurrences and his subsequent recovery following them demonstrate his vast capability to respond to the challenge of nature by creating and controlling appropriate tools. The challenges are unending, however. Since 1960 there have been more than 100 major disasters in the United States alone. Forty-one states and four territories have received more than $300 million in federally allocated disaster funds during this period. Twenty-five major disasters occurred in 1964 and again in 1965, the worst two years in the history of the Federal Disaster Act. Each year more than $100 million has been allocated as a result of declarations of states of emergency by the President.

Thus, it is clear that in the affairs of government, in the military, in public and private organizations as well as in our individual lives, emergencies and disasters of various kinds are a grim possibility. These extreme situations call for the commitment of unexpected resources and manpower to cope with circumstances not present in day-to-day life. To meet such situations effectively, those officials responsible for preplanning emergency responses must consider prior experience, the efficient use of available resources and the development of new techniques for prevention, control and recovery. All of these considerations indicate a need for wide-scale analysis.

The first systematic and objective analyses of disaster in this country occurred early in the 20th Century with the work of William James on the San Francisco earthquake and that of Samuel Prince on the catastrophic explosion at Halifax, Nova Scotia, in 1917. Since that time, scholarship in the field has been encouraged by professional associations, through panel discussions on disaster and stress, and through journals concerned with the subject of emergency planning and disaster control. More comprehensive efforts have been sponsored by the Disaster Research Group studies of the National Academy of Sciences, and by the Office of Civil Defense, the Air Force, and the National Science Foundation.

An Embroyonic Art

Nevertheless, the prediction of the onset of emergencies and evaluations of their intensity is an embryonic art. For the most part, it is still true that authorities must define the situation using meager data, hoping the action they choose to take is appropriate despite the shortage of time for careful analysis or for the efficient allocation of available tools.

The goal of emergency operations and disaster control must be to anticipate certain crises and thus plan how to meet them effectively as unpleasant but not totally unexpected intruders.

The Need for a Symposium

The first formal Symposium on Emergency Operations was held to provide a forum for discussion of plans and operations designed to cope with such anticipated and conceivable crises. In keeping with SDC's corporate charter and its traditional interest in national security and public welfare, the two basic objectives of the symposium were to allow experts to discuss the state of the art in selected areas of emergency operations, reviewing both theory and actual experience; and to inaugurate a continuing dialogue aimed at improving emergency prevention as well as planning of and performance in emergency operations. Hopefully, this presentation of the symposium's proceedings will act as a catalyst for such a continuing analysis.

One stimulus for the development of the symposium was the recognition of a common interest among disaster specialists and emergency operations planners. Another was SDC's research and development efforts in this area, including its own Emergency Operations Research Center. In it, operational experts and planners participate in simulated emergencies, during which disasters are scheduled and crises analyzed "by appointment." Such an environment allows for studies of natural disasters, civil defense efforts, communications and reactions to stress. These analyses have demonstrated a considerable ability on the part of the Center's staff to improve efficiency in emergency operations, to impart new skills through practice and training in unexpected but controlled circumstances, and to adapt existing tools to meet expected or novel emergency problems.

A third significant stimulus for the symposium was the recognition that a new profession is in the making--that of disaster or emergency operations specialist. Military, fire, police and medical experiences in emergency services provide some guidelines for this evolving occupation, but no firm definition.

Finally, contingency emergency planning must consider financial, social and political costs; the development of definitive doctrine or policy; the application of pertinent, current research; the use of effective direction and control techniques; and the exchange of information yielding valuable state of the art intelligence. A conclave of interdisciplinary experts promised to provide a source of vital data across this broad spectrum of need. And, indeed, that promise was fulfilled.

The Program

Fires, epidemics, civil disorders, natural and nuclear disasters are the kinds of events requiring the organization of emergency operations. In addition to the diversity and complexity of the disasters themselves, other large-scale

considerations are involved. For instance, mutual aid commitments among nations and state and local governments are designed to offer assistance to neighboring areas and to facilitate survival and recovery. Usually all facets of government are called into service--law enforcement, fire, transportation, engineering, public works, communications, warning, medical and welfare services, sanitation, registration, and direction and control activity conducted by vested government authorities or by locally organized groups of volunteers. At the same time, public information programs and mass communication media frequently are used to influence the populace and to speed recovery.

Contingency planning for such emergency tasks involves determining general strategies and specific tactics ordered according to priorities, alternatives and their cost to society. The complexity of these considerations does not lend itself to a tidy presentation of issues and answers. Adequate definition of jurisdictional boundaries and appropriate flexibility in the organization of a response is a necessary goal. Demands placed on elements of the system frequently exceed the prerogatives of local authority and the availability of community resources.

An inventory of concepts and procedures is needed to give decision makers a method to define situations and to acquire information that will enable them to take effective action.

To provide a meaningful range of information to assist in accomplishing this extraordinarily complex task was a leading purpose of the Emergency Operations Symposium. The development of a program, therefore, was no simple matter. In seeking to meet the desired goals, the program evolved to include discussions of:

- Federal, state and local organizations

- Emergency operations resources

- Planning to improve future performance

- Public impact

Each of these four areas was the subject of separate panels, which included conceptual reviews and accounts of practical experience or research. In all, 13 papers--covering both research and operations--were presented at the symposium They are compiled herein in the order of their presentation and under the heading of their respective panel association.

In addition, a discussant reviewed and provided a critique of the papers given at each of the four panels. A brief summary of the contents of each paper follows:

PANEL ONE: FEDERAL, STATE AND LOCAL ORGANIZATION

I. Organization Under Stress

Enrico L. Quarantelli, Ph.D.
Department of Sociology
Disaster Research Center
Ohio State University

Various types of organization might be used to cope with disaster, including both established and emergent forms. Organizational response requires performance of both regular and unusual tasks. Definition of boundaries, utilization of experience and measures of efficiency leading to effective prediction and control are considered.

II. Jurisdictional Problems and Mutual Aid Trends

Andrew S. Bullis
Assistant Director
American Society for Public Administration

Many communities and states are unaware of the fact that existing governmental structures may impose undue constraints on the ability to meet emerging problems. The number of problems solvable by self-contained efforts of individual communities is declining. Some enlarged measure of cooperation and definition of areas for fruitful joint effort is necessary.

III. A Survey of Possible Wartime Hazards

Hal Brode, Ph.D.
Physicist
The RAND Corporation

An array of hazards, including fire, chemical and biological weapons, and nuclear effects are discussed. Prerequisite to effective planning is the definition of the specific threat. Many realistic threats exist, but not all are applicable to every community. During nuclear attack organized aid from the external areas is less likely because of widespread effects.

Panel One Discussant: Seymour Vestermark, Ph. D.
                        Human Sciences Research

PANEL TWO: EMERGENCY OPERATIONS RESOURCES

I.   Disaster and Recovery

        Howard Kunreuther, Ph.D.
        Institute for Defense Analyses

The Alaskan earthquake is analyzed, considering recovery techniques and poten-
tial, capital, labor and speed of allocation of resources. The possibilities
of eliminating inequities through extended insurance coverage and other pre-
ventive techniques are suggested.

II.   Manpower Resources - Role Conflict and Training

        Meda White
        Research Associate
        Head Start Program
        Department of Education
        University of Texas

Elements of organization and assumption of responsibility are reflected in the
performance of individuals in disaster roles. Activities and capabilities
within tornado stricken communities are delineated. Discussion covers the
speed of collation of information yielding facts necessary for effective action
as well as personal reasons for justifying failure and reassigning responsi-
bility.

III. Law Enforcement in Riots and Insurrection

        Raymond M. Momboisse
        Deputy Attorney General
        Department of Justice
        State of California

Coordinated effort by state and federal governments is leading to the produc-
tion of riot manuals that suggest appropriate control tactics and preventive
measures that can be undertaken at different organization levels.

Panel Two Discussant: Ralph H. Turner, Ph.D.
                         Chairman
                         Department of Sociology
                         University of California at Los Angeles

PANEL THREE: PLANNING

I.   Planning for Emergency Operations

        Kurt Lang, Ph.D.
        Chairman
        Department of Sociology
        New York State University at Stony Brook

        Gladys E. Lang, Ph.D.
        Chief, Field Research
        Center for Urban Education

Criteria for classifying and possibly measuring types of emergencies are
described. The novelty of the event, attrition of motivation and resources,
degree of crisis as a function of demands exceeding resources, choice among
values, competition within sections of the community and conflict among
organizations are discussed.

II.   Observations on Emergency Operations in a Civil Disorder

        Marv Adelson, Ph.D.
        Principal Scientist
        System Development Corporation

The Los Angeles Watts riots provided an opportunity to learn about the problem
of controlling civil disorder. Some observations that were made from a study
of those riots, and some implications of those observations for future riot
control are presented.

III. Disaster Medical Care

        Francis C. Jackson, M.D.
        Chairman
        Committee on Disaster Medical Care
        American Medical Association

Revised concepts of organization and authority, coordinated emergency services,
traffic control, communication, and triage in medical disasters are suggested.
A distinction between the responsibilities of public health and emergency
medical care is considered desirable.

Panel Three Discussant: Charles Rainey
                          Stanford Research Institute

PANEL FOUR: PUBLIC IMPACT

I. Public Reaction to Emergencies

        Jiri Nehnavajsa, Ph.D.
        Chairman
        Department of Sociology
        University of Pittsburgh

A statement of requirements for various emergencies is based on analysis of
the limits and intensity of the public's reaction. These requirements would
identify causes and possible controls according to categories and likelihood
of success. From the standpoint of social prestige, the profession of
disaster specialist is rewarded least when its success is highest. For
example, when an efficient police force deters crime within the community,
criticism is likely to arise because of lack of activity on the part of the
police.

II. Accommodation to Threat

        Stephen B. Withey, Ph.D.
        Director
        Institute for Social Research
        University of Michigan

By diagramming the factors influencing the definition of threat and possible
reaction to it, one can hopefully predict an array of effective defenses. The
amount of fear, the pace of reaction and the sequence of action are all part
of the resultant behavior.

III. New York Emergency Plans and Experiences

        Lt. Gen. M. J. Asensio
        Director
        New York State Civil Defense Commission

Within the New York civil defense organization, political authority and civilian
advice are linked. Provisions for storms, droughts, nuclear attack and black-
outs has added to the flexibility of the organization. Within two months fol-
lowing the New York blackout, an interim emergency radio system was developed,
demonstrating cooperation, support and effective planning.

IV.   Planning a Nationwide Natural Disaster Warning System

Paul H. Kutschenreuter
Director
Office of User Affairs
Environmental Science
Services Administration
U. S. Department of Commerce

The 1965 Palm Sunday Tornado disaster in the Middle West demonstrated that the existing warning system was inadequate. A proposed Nationwide Disaster Warning (NADWARN) system has been developed that strives for optimum use of existing facilities as well as for improvements leading to more effective emergency plans and operations to cope with natural disasters.

Panel Four Discussant: Lewis M. Killian, Ph.D.
                         Chairman
                         Department of Sociology
                         Florida State University

IN REVIEW

The symposium participants* discussed emergencies ranging from heavy snowfall to nuclear war. The attendees ranged from professionals in research and academic institutions to operational organizations; from local to national government officials; and from emergency specialists to planners of large-scale civil defense preparations.

The focus in practical areas was on police, fire and medical activities as demonstrations of emergency services. Civil defense was a frequent topic in discussions. The interaction of researchers with practitioners responsible for local administration and operation was of value because theoretical concepts could be measured against practical experience and actual occurrences.

CONCLUSIONS

The symposium accomplished its purpose by stimulating a dialogue that can improve planning for and performance in emergency operations. Many useful procedures and concepts emerged and are documented in the proceedings. In the closing sessions, the participants suggested that further efforts should be made to continue the analysis of emergency operations in subsequent conferences. SDC is considering a second symposium to be held sometime in 1967

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*A list of participants appears immediately following this Editor s
 Introduction.

Throughout the three days of meetings and formal as well as informal discussions, the predominant theme that emerged was that further research, comparison of measures to cope with emergencies, and categories of the available tools in the field are urgently needed. The final session, held in the SDC Emergency Operations Research Center, indicated a great deal of interest in the prospect of thorough analysis of particular procedures and techniques through simulation. Systematic study in both field and laboratory settings can, it was maintained by many, lead to the appropriate blend of techniques and operational concepts to make possible a more adequate response to emergencies. In this way, the haphazard art of muddling through can be gradually replaced by planned action based on tried methods of prediction, prevention and control generated from specific studies of various kinds of crisis situations.

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Hawaii Civil Defense Office
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*This list does not include the 14 speakers nor the 4 discussants, particulars
on whom are presented in the main body of the text and in the preceding Editor's
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    Robert J. Wolfson
    Kenneth W. Yarnold

PANEL ONE

FEDERAL, STATE AND LOCAL ORGANIZATION

I. ORGANIZATION UNDER STRESS
Enrico L. Quarantelli*

My remarks are going to be primarily focused on the first term in the title of this paper namely, "organization." I will attempt to point out that the word "organization" can be viewed as referring to at least four different types or kinds of collective or group efforts to cope with community emergencies, especially natural disasters. However, I will not totally ignore the other term in the title, "stress." Afterward, my concluding remarks will suggest how the presence or absence of the four different types of group effort might possibly be taken as an indicator or index of the degree of crisis existing in a community system.

The observations I shall make will be based upon some of .he empirical research --of both a field and laboratory nature--as well as the theoretical analyses we have been conducting since August, 1963 at the Disaster Research Center (DRC) at Ohio State University. The field research, as most of you probably know, has been supported by the Office of Civil Defense (OCD). We at DRC have had occasion to study 35 different disasters, including 7 in foreign countries. In addition to initial field trips at the time of emergency operations, we have conducted a number of in-depth and longitudinal studies, in some instances returning more than a half dozen times to the disaster area. I shall be citing examples from different disasters. In most cases, however, in order to maintain the confidentiality we promise our respondents, I will not identify by name either the particular organizations and groups or specific disasters involved.

My remarks will also reflect a so..ological perspective. Undoubtedly there are other roads to truth available. But I am a sociologist, and the bulk of the Center's professional staff are also members of that discipline. Apart from that fact, however, I do believe that the problem of responses to at least large scale disasters do particularly lend themselves to sociological analysis. By definition, sociology is the scientific study of group life. What we have in a community disaster and many other similar stress-like situations is an interruption of usual group life; in the extreme case, a disruption of the normal patterns of social behavior. Certainly at a theoretical level such social phenomena are central to sociological concern.

However, although sociology may be able to present an abstract perspective, it is to other disciplines and professions that we must turn for practical implementations. As a sociologist I may have some knowledge of typical organizational problems, but it does not follow from that I have any great competence as a social engineer. Perhaps this is just another way of stating that I will mostly

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*Dr. Quarantelli is associated with the Department of Sociology, Disaster Research Center, Ohio State University.

talk about certain ways of looking at a problem, and very little on how planners
and officials who have to concern themselves about such matters can go about
specifically solving the problem.

As a final preliminary remark, I should note that in what follows, you will be
asked to perceive the organized response in disasters in perhaps a somewhat un-
conventional or unorthodox way. Although the focus will be on groups, many of
you may not ordinarily consider some of what will be discussed as group behavior.
Likewise, you may not initially recognize our four types of collective responses
to stress. The distinctions will not be in terms of the usual federal, state or
local agencies, or other typical administrative and political categories. It is
not that distinguishing groups by such labels is invalid. For many purposes,
this is a useful way of thinking about group responses to emergencies. However,
in my remarks I will try to show that there is an alternate approach that might
have some merit. At the moment, I merely ask you to be prepared to shift your
perspective, to slice reality in a different way, along unfamiliar lines.

Although we have recently extended our research interests, the initial and still
foremost task at DRC is the study of organizational functioning under stress.
When we started, the task seemed, relatively speaking, simple enough in terms of
intent. We fully realized there would be many difficulties in doing comparative
and systematic research. But we were going to look for organizations such as
police and fire departments, hospitals, Civil Defense (CD) agencies, public
utility companies, Red Cross chapters, Salvation Army groups, mass communication
outlets, and so forth. Having identified the unit of analysis--the organization
--we at DRC were going to study their operations in extreme stress situations.

However, DRC had not conducted too many field studies before we became aware of
some difficulties even with the matter of identification. The "organization"
that was supposed to be present was sometimes surprisingly difficult to find.
On the other hand, there were clear-cut cases of collective endeavor, which did
not fit our initial formulation. I will not detail here the history of our
problem or the various steps DRC took to cope with the difficulty in its actual
field work. Suffice it to say that the reality of data forced some rethinking
about the nature of the problem. What could be meant by "organization?"

The core of the problem is, as I implied in my very first remarks, that there
are (or at least could be) four different kinds of organized responses to com-
munity-wide disasters. When I was first asked for a title on what I intended
to talk about, I said "organizations under stress." In the course of coming
West, the "s" fell off the word organizations and I eventually saw that I was
to speak on organization under stress. As it turns out, the second title is
really the far more appropriate one, since my basic point is that while there
is organization in disaster situations, such organization does not always in-
volve organizations or formal groups as such. There is always organized or
collective effort, but not necessarily involving only formalized groups.

I personally came to this conclusion on the basis of two recurrent observations regarding the social behavior that occurs in a large scale emergency. The observations have to do with the nature of the tasks undertaken following a disaster, and what groups carry out these tasks. That is, while there are organized efforts to cope with the threat to the community, different kinds of tasks are carried out by different kinds of groups. In the most abstract sense, at the one extreme there are regular tasks undertaken by established groups. Then at the other extreme there are non-regular tasks carried out by emergent groups. (What I mean by regular and non-regular, established and emergent will be illustrated shortly.)

However, there is more than a dichotomy involved in the above. In fact, there are two axes--there can be an organized or collective effort to carry out regular or non-regular tasks; also the collective effort can be undertaken by established or emergent groups. The more mathematically inclined among you can easily see that this leads to a two-by-two table. Along the top you have tasks --regular or non-regular. Down the side you have groups--established or emergent. Thus, you may have an established group doing regular or a non-regular task, and an emergent group engaged in a regular or a non-regular task.

Tasks

	Regular	Non-Regular
Established	Type I	Type III
Emergent	Type II	Type IV

Groups

Let me give some concrete body to these types before developing the terms. Type I (an established group carrying out regular tasks) would be exemplified by the official members of a city police force directing traffic after a tornado has struck a community. Type II (an emergent group with regular tasks) would be illustrated by Red Cross volunteers running a shelter after a hurricane. As for Type III (an established group undertaking non-regular tasks), an example of it would be a home-construction company utilizing its men and equipment for digging through debris in the rescue work undertaken after a major explosion. Type IV (an emergent group engaged in non-regular tasks) would be represented by an ad hoc group made up of the City Engineer, County CD director, the local representative of the State Highway Department, and a Corps of Engineer Colonel, coordinating overall community responses during a flood.

The organized emergency efforts illustrated in these examples clearly range from traditional, complex, formal organizations to temporary, simple, informal groupings. Perhaps all the groups that can be seen working in a disaster will not fit neatly into one of the four categories. Clearly this is an ideal type conceptualization. But I would argue that in a large scale emergency almost all operative groups--and in its groups we are talking about, that is, social entities whose participants are relatively self-conscious about being members of the groups--can be classified, without too much forcing, into one of the four types.

As for the key terms involved, this is what we have in mind. Groups carry out certain tasks, but the tasks may be old, routing, assigned, everyday ones. Or instead of being regular, the tasks may be new, novel, assumed, or unusual ones for the groups involved. If a police department controls traffic, a fire department fights fires, a radio station transmits news, or a hospital treats injured, we all recognize the regular or traditional nature of the task for the group that is carrying it out. On the other hand, the non-regular or newly created nature of tasks can be seen when we observe a National Guard battalion providing water for citizens, an American Legion Post sheltering homeless evacuees, or nuns from a parochial school sorting and distributing donated clothing at a relief center. In terms of the prior experience of the group, it seems possible to class tasks as either regular or non-regular, as old or new.

It is also possible to distinguish between established and emergent groups. An established group is one in which the members stand in definite kinds of pre-disaster social relationships to one another, especially in their work activities. Such groups may be highly bureaucratic in structure as in a fire department; or they may be considerably less formal in nature as in a VFW Post. However, this is not the crucial element. Rather it is an existence as a group prior-to-the-emergency, and conscious identification of group membership that are the distinguishing features.

Important to our understanding of established groups is that during a disaster the group members stand roughly in the same work relationships to one another as they stood before any threat to community life. Thus, members of a city public health department or a citizen's band club operating in a disaster normally have had extended and prior-to-the-emergency work relationships with one another. These social ties are maintained as the group engages in traditional or non-regular tasks during the disaster. In a sense, there is a carry over of pre-disaster social bonds related to work activity into the emergency situation.

In contrast, an emergent group, as the term implies, develops or comes into being in the emergency. Such groups may mushroom from some small, pre-disaster cores, or they may involve the crystallization of totally new social entities. The crucial feature is that they have no actual pre-emergency existence, at least in the manifest form they assume during the disaster period. An example would be a local Red Cross chapter whose handful of full-time, paid personnel

provide the nucleus for large blocs of volunteers who actually undertake most
of the group's work. Another example of an even more emergent kind of group
is the search and rescue team or teams that typically spring forth in the
immediate post-disaster emergency period. Note that the emergence of the new
social entity may be partly planned or may be totally spontaneous, but in both
instances the actual group comes into being only during the emergency period.

In such emergent groups, although members may have had some social contacts with
one another prior to the disaster, they have not participated as members of the
same group. For instance, the membership of a State CD group during a disaster
may be tremendously inflated by the incorporation of many workers drawn from
various state agencies. Some of the personnel may have had informal social
relationships with one another prior to the emergency, but they have not
functioned as common members of the same work group. Consequently, and this
is what is important, the members of the emergent group, as they work at regular
or non-regular tasks, have to forge out a new set of social relationships among
themselves. That is, a group with personnel and specific tasks has emerged,
but few clear-cut social roles or specific norms governing the work behavior of
members, one to another or to non-group members, exists.

Even when prior plans have existed to generate the emergent groups, the plans
at best can only present official guidelines for behavior. The structure of
groups, however, consists of more than formal prescriptions of how members in
particular positions should act. Emergent groups have to develop these other
structural elements. (Incidentally, the latter is a factor often overlooked in
planning efforts.)

It should be observed that the key distinctions being made here are not between
groups with permanent personnel and those that use volunteers, or whether a
group expands by plan or by informal convergence of persons. These distinctions,
important for other purposes, are less crucial here. Instead, the basic
difference being stressed is that between groups who have an actual and function-
ing existence prior to a disaster, and those groups whose very existences or
manifest being are generated by an emergency situation.

I will now discuss each type.

Type I groups typically are those we designate--at least in sociology--as com-
plex organizations with a bureaucratic structure. Para-military formal groups
such as police and fire departments best exemplify these kinds of organizations.
However, public utility companies, general hospitals, and many city government
departments are, in varying degrees, "birds of the same feather." In pre-disaster
situations, these groups have a fairly clear-cut line of authority, specific
tasks, designated channels of communication, and explicit decision-making roles.

Of particular interest is that often these organizations seem to attempt to
adhere to major regular activities as much as possible even during a major
community emergency. Along some lines, there is relatively little change in

the behavior of these organizations. Typical for instance, is the effort in a disaster to confine themselves to traditional tasks. The telephone company tries to concern itself with only phone service and very closely related activities. If a police or fire department is forced at the height of the emergency to engage in some search and rescue, there is an effort to revert back as quickly as possible to the regular work of maintaining security or fighting fires. Whether intended or not, such restriction of activity has the consequence of helping to prevent disaster demands on Type I groups from outstripping organizational capabilities.

Typical too is that these groups try to depend almost exclusively on their own full-time personnel. A few such organizations may at the height of an emergency supplement their work force with some volunteers, but they are released as quickly as possible. Or, if volunteers continue to be used, they are shifted to the control of non-Type I groups. For example, in one disaster studied by DRC, the fire department after initially and literally accumulating a large floor full of volunteers, sent them home or to other groups such as CD. Sometimes, as in the instance of electric and gas companies, a Type I expansion occurs through borrowing of personnel from similar organizations outside the community, rather than through the incorporation of local volunteers. Such actions would seem to be a function of the required technical skill needed to operate in these kinds of organizations. The flying-in from afar, of physicians and nurses to local hospitals would appear to be another illustration of this point. Whatever the reason, Type I organizations, attempting to restrict themselves to traditional tasks even in an emergency, tend to use only their own personnel, or almost identical personnel from similar groups elsewhere. (It is perhaps of interest in this connection that the master disaster plan of the telephone company visualizes technicians in many positions as interchangeable as material parts, irrespective of the section of the country in which the emergency might happen.)

I said a little earlier that Type I groups seem to change relatively little during a disaster. Perhaps this should be qualified to saying there appears to be little change in that the permanent (or interchangeable) personnel continue to undertake the regular tasks of the organization. Nevertheless, in an emergency there often are in these groups varying kinds of internal structural rearrangements. Decision-making, for example, tends to occur at lower levels in the hierarchy than is normally the case. A number of the DRC in-depth studies have particularly focused on ascertaining such internal organizational changes and the conditions underlying them. However, I do not have the time to depict this part of DRC's research. Let me merely say that whatever the internal changes and conditions responsible for them, they seem to allow the organizations of which we are talking about here to function approximately in the same way in both the pre-disaster and emergency periods. It is certainly the experience of DRC that Type I organizations do not often undergo great stress. The demands of a disaster seem in most cases as well met as everyday demands. Not always, but extremely often. The exceptions appear to be in those instances where the Type I organization attempts to assume non-traditional tasks and in

that sense accepts new, rather than just traditional demands on the group.

A final word on Type I groups that I hope will not be confusing, although it adds to the complexity of what we are discussing. While we have used particular examples of such organizations (e.g., police departments), it does not follow that all specific concrete instances of similar name or activity are necessarily Type I groups. Obviously a one, two, or three-man police force in a small town is hardly a complex organization. In fact, in most such cases there is no collective entity. Some police departments are simply not groups, but just a person or two playing particular occupational roles. What I am trying to say by this is that one cannot identify a Type I (or for that matter a Type II, III, or IV) group solely by label or by the normal functions of particular persons. Rather, the existence and classification of each specific group is a matter for empirical determination.

Type II groups are often, although not exclusively, those known in sociology as voluntary associations. Some examples of these would be typical Red Cross chapters, Salvation Army units, some sheriffs' departments, many local and state CD agencies, and a few church welfare auxiliaries. These are groups that generally have a small, central, permanent core or cadre of workers during non-emergency periods. Furthermore, these groups have certain traditional tasks, but during routine times the tasks are not directly related to existing or current community emergencies. For example, local Salvation Army units in their day-to-day activities frequently house and feed the indigent, conduct religious services, man centers for rehabilitation of alcoholics, provide assistance to unmarried mothers, and so forth.

However, and this is crucial, Type II groups have a latent emergency function. That is, apart from their manifest activities in day-to-day community life, it is clearly expected that these groups will become active in a different, general way in disaster operations. In one sense, they can be seen as social nuclei with stand-by functions, kinds of community mechanisms ready to be activated to deal with anticipated needs in large scale emergencies. Thus, when a disaster occurs, these pre-emergency groups provide the name and the permanent workers the core of new, emergent groups. In the transformation two basic changes occur, as follows.

The first basic change that takes places is that the new group is considerably larger than the old core. Great number of persons, not working members of the group in normal times, join in the activities of the permanent staff or cadre. Many of the joiners may be volunteers, as in the case of the expansion of local Red Cross chapters during a disaster. This, however, is not always the case, as can be seen in the instance of some CD cores who incorporate by plan other governmental personnel at the time of an emergency. Very often the regular, permanent staff becomes but a small fraction of the total number of workers operating under the group label during the disaster. The bulk of the work is actually carried on by the new members. In one disaster systematically studied by DRC, the radio of informal volunteers to full and part-time professional Red

Cross workers was at least 10 to 1, at times perhaps 20 to 1.

The other major change is that the latent emergency function of the association is activated with a consequent undertaking of traditional although not everyday tasks. In some cases, major everyday activities are temporarily laid aside. Thus, local CD agencies during a natural disaster will cease concerning themselves with the enumeration or stockpiling of fallout shelters. Red Cross chapters will suspend their training classes in first-aid, water safety, and home nursing. In the case of other groups, traditional emergency tasks will be given as much attention as traditional routine activities. For example, a Volunteers of America mission will continue to run its home for the aged, but it may also participate extensively in disaster relief work because it has done so in the past in that community. A sheriff's department with mobilized auxiliaries may continue to patrol for traffic violators in a rural county, but also assume, as might be legally required, the formal control of the overall emergency response.

Type II groups typically have many problems in a disaster. They are often among the organizations that the DRC has found to undergo the greatest stress in an emergency. There are undoubtedly many reasons for this, but three factors seem to be particularly involved.

First, these groups unlike Type I groups change both their overall structure and function at the time of a disaster. Although the name remains the same, it is a new group that emerges with partly "new" personnel carrying out traditional but normally latent tasks. Changes in social arrangements are not easy under the best of circumstances, but these groups have to make the transition under very difficult conditions.

In the course of transformation from routine-oriented groups to emergency-functioning groups, Type II groups may undergo intensive and extensive changes in both internal structure and external relations. This can be observed when many state and some local CD units incorporate either state or city governmental workers into their disaster activities. In these cases for example, permanent core personnel occupying pre-disaster positions of moderate supervision over a limited few, are often elevated during the emergency, to near the top of the governmental hierarchy and with legal authority over many. This change in statu can be the occasion for difficulties if incorporated persons or groups are unwilling to accept the fact that they have come under different authority positio during the emergency. This is merely one illustration of the kind of problems that can arise as a result of the structural changes Type II groups undergo.

Furthermore, the carrying out of the emergency functions of Type II groups often necessitates the use of personnel who for various reasons are relatively ineffective. For example, all Type II groups tend to suffer from the fact that most of their temporary members in the expanded groups typically lack skill in performing their newly assumed work roles. This is not surprising. Volunteers or draftees, teenager or housewife, they generally lack knowledge and prior

training for the disaster-related work they attempt to do. To be sure, some Type II groups such as the Red Cross make major efforts to train at least their official volunteers. Even such training, however, generally cannot give all the emergent group members the experience of working together. That is, Type II groups have an almost inevitable problem in that their members (which include both permanent core and temporary workers) have had no common experience in actually carrying out regular emergency functions.

The second reason why Type II groups usually undergo the greatest stress in an emergency is because the boundaries of these groups are generally very vague during emergency periods. In fact, persons may be operating in the name of CD or the Red Cross for instance, and actually carrying out latent emergency tasks of such groups, without the knowledge or at least control by the permanent core. I have personally observed in several disaster settings the bewilderment of regular CD personnel when they suddenly learned that some subgroup, of which they had not even been aware, was acting in CD's name. I should inject, incidentally, that in all cases of such behavior that I am aware of, no malicious intent ever seemed to have been involved. In fact, in one disaster the local CD discovered several smaller groups were taking supplies out of warehouses and stockpiles and doing it in the name of CD; but, these smaller groups were actually leaving little requisition notes to indicate the full legitimacy of the act of breaking in and removing the supplies. This is an extreme case of initial lack of awareness and control by Type II groups of activities carried out in their name. However, it is not rare for the professional workers in a local Red Cross chapter, for example, to have little knowledge about what the mass of both official and unofficial volunteers who associate themselves with the Red Cross in a major disaster are doing for the chapter, and in its name.

On the other hand, there sometimes is a tendency for the core of Type II groups to try to extend the boundaries of their groups, to identify as being within them anyone whose work relates to their latent emergency functions. Thus, in one disaster studied by DRC, a local CD director attempted to label all governmental emergency activity as being performed by CD. Yet, clearly many of the officials involved were acting solely in terms of their formal positions in established groups and not as nominal members of CD. Almost all working gr ps try, of course, to obtain credit for their activities in a disaster. But ")e II groups are particularly vulnerable to attempts to maximize a claim (for reasons we will not examine here). The consequence is a tendency to identify as activities of the group, emergency tasks really being carried out by other groups, representative of other groups, or just individuals operating on their own.

Another reason for the high incidence of stress for the Type II groups is because the latent but regular emergency functions for these groups are usually quite vague and general. At times, even a formal directive may be no more specific than a charge "to coordinate disaster activities" or "to help disaster victims." This lack of specificity appears to have two consequences. First, unlike Type I organizations, who retrench to regular routine tasks as soon as possible, Type II groups seem vulnerable to going beyond even their usual latent emergency tasks.

Thus, in one disaster DRC studied the Salvation Army engaged in a massive
feeding program, a rather unusual activity for that particular group. Second,
the vagueness of emergency tasks may lead several emergent groups to attempt
them almost simultaneously. In another disaster studied by DRC, the Red Cross,
the local CD, and the Salvation Army were all involved in putting together a
list of missing persons. Note that in both examples given, the tasks attempted
were important and to be anticipated at times of community disaster. These and
other cases that could be cited, suggest to me that perhaps there might be some
advantages to the vagueness and generality of latent emergency functions of Type
II groups. Perhaps this is a way that communities have evolved to ensure major
disaster problems will be met, even though stress is generated for particular
groups.

It might strike some of you as odd to talk of the Red Cross or CD as emergent
groups. However, if you ever had the experience as we have had at DRC of trying
to match systematically the structure of such groups, first before, and then
during an emergency period, you will not find the idea not at all unusual. In
certain disasters, the only common element between the groups in the two time
periods seems to be that the same label for purposes of identification is being
used, but the personnel involved and what they are doing have changed drastically.
The group in what we at DRC call Time Period One (the pre-disaster period) and
the group in Time Period Two (the emergency period) is often different both in
degree and in kind. In that context, I believe it is useful to think of a new
group emerging with the old group providing the name as well as the same core
or cadre of personnel.

Type III groups are probably the most numerous of all groups in large scale
disasters. Sometimes they do not stand out as clearly as other groups because
their members very frequently work in conjunction or intermixed with Type I or
Type II groups. Thus, a citizen's band club may help man or actually provide
the operators for a local CD communications network; a church group may assist
in staffing and operating a shelter under nominal Red Cross supervision; or a
veteran's post may provide auxiliaries to supplement or relieve the State Police
in the task of traffic control. Considerably more rarely, a Type III group may
operate relatively independently of other groups, as when a fraternal order sets
up its own clothing distribution center.

A key observation regarding the above is that in such situations the partici-
pants are primarily acting on the basis of their pre-disaster group affiliations.
These people are in fact involved in emergency activities because of their own
group's formal or informal participation. I am not talking here, of course,
when isolated persons acting as individual citizens help out complex organi-
zations or associations. Rather, the referent is when participation in emergency
activities in part of a group activity. Sometimes this is rather explicit as
when a church offers the services of all the nuns in a city, or a high school
releases students from classes to build dikes. Clearly in such cases of quasi-
drafting, participation in the emergency community response is the result of
pre-disaster group membership.

Because it is vital to understanding the nature of Type III groups, let me partly restate the point just made. When I talk of a Type III group, I have reference to a collective entity, not to persons from identifiable groups acting as individual volunteers. For example, Boy Scouts can frequently be found serving as messengers at disaster headquarters. However, in such cases, they are rarely acting as members of a particular Boy Scout troop. Rather, they behave as individual Boy Scouts who happened to volunteer for work with the local CD. In those situations, they are not members of a functioning, separate group of Boy Scouts. It is different from, let us say, a building contracting firm using its own men and equipment as a unit to remove debris off highways. Our interest in this discussion is focused on the latter kind of phenomena.

What is the selective factor at work making for Type III groups? I do not believe we at DRC have yet established what it is, but I would like to offer two impressions. Groups with a normal time "Public service" orientation often seem to become Type III groups. Thus, not all fraternal clubs come to participate in emergency responses to disasters, but primarily those with everyday general humanitarian goals, or those with a history of public service of some sort to the community at large. I suppose it might be said that there is some sort of cultural expectation that such groups "do something" at times of disasters. Possibly also, the makeup of the group in normal times might be a factor. Groups whose members have close interpersonal ties with one another seem to be disproportionately represented in the Type III category. This is, that while such groups may have a formal structure, they are also characterized by the presence of strong personal social ties among their members.

Obviously not all community groups join in the effort to cope with a major disaster. As Barton[1] has pointed out, many groups even of a highly formal sort cease operations in such a situation. Many business firms and schools, for example, simply close down. They neither attempt to carry on their usual tasks, nor can they shift, as do Type II groups, to latent emergency tasks (for as groups they have no such latent functions).

Type III groups--although they do not have manifest emergency functions--do play a part in responses to natural disasters. Generally, they engage in non-regular tasks. These tasks may be routine or traditional for other groups, but they are new for Type III groups. For example, certain Type II groups regularly shelter disaster victims, but it is an innovation for churches not only to be used as shelters, but staffed by members of the congregation.

Type III groups particularly seem to present some problems for the other groups with which they often work. One high official I once interviewed noted that his own association had been immeasurably assisted by the help rendered by literally

1. A. H. Barton, <u>Social Organization Under Stress: A Sociological Review of Disaster Studies</u>, Washington, D. C.: National Academy of Sciences - National Research Council Publication #1032, Disaster Study #17, 1963.

platoons of nuns who supplemented his own work staff. However, as he somewhat wryly observed, "even ministering angels in white can present a few difficulties. Part of what is involved seems to be that while Type III groups often work in conjunction with Type II and I groups, they do not really come under the effective control of the latter. Type III members frequently remain primarily oriented to their own group affiliation. The potentials for disagreements and conflicts in this is obvious.

Type IV groups are by far the most difficult to talk about and discuss. They have no pre-disaster existence and when the emergency is over they dissolve. Usually, although DRC has found exceptions, these generally small and ephemeral groups bear no name. Typically, although here also there are contrary cases, the groups develop no clear-cut structure. Yet they do emerge in large scale disasters if not most major community emergencies, and play a crucial part in the collective response.

Before attempting to clarify the nature of these kinds of groups, let me note that there are three kinds of disaster conditions that seem to generate them. Sometimes as a result of a potential or actual community emergency, there is a lack of coordination between the major groups operating in the situation. There also may be no overall control of the various activities going on, or the community may lack information as to the nature of the threat with which it is being confronted. In short, the three key conditions that seem to generate Type IV groups are lack of overall community coordination, control and information. Let me explain further.

In apparently all major disasters, usually in the early hours of the emergency period, there occurs a meeting. This meeting typically involves representatives of the major groups as well as informal leaders most active in disaster-related activities. Their coming together seems generated by a "community need" to coordinate, control, and become informed about the diverse, multiple, and frequently overlapping emergency activities being attempted. The nature of the disaster does not seem to be a crucial factor for DRC has noted such meetings in as highly divergent disasters as the Indianapolis Coliseum explosion, the Alaskan earthquake, Hurricane Betsy in New Orleans, and floods in Montana.

Important for our purpose is the fact that some sort of a group often emerges out of such a meeting. The participants develop some sort of understanding about their relationship to one another, including the matter of authority, and their overall objectives including the issue of priorities in courses of actions to be followed. In one sense, such emergent groups are almost ad hoc committees developing their rules of procedure as different problems arise. If you think of it in this way, you can see why Type IV groups are classified as emergent groups with non-regular tasks.

Let me cite some specific examples. In one disaster studied by DRC there emerged a core group consisting of the City Engineer, the Planning Director, and the City Building Inspector (plus partial participation by representatives of other groups

Operating out of the Engineer's office, the core members for three days co-
ordinated almost all the emergency responses in a city and county area. The
group that emerged had no prior existence, had not been planned for, and engaged
in tasks that had not been anticipated in that community.

In still another disaster studied by DRC, five men constituted the emergent
group primarily engaged in maintaining overall community control of emergency
operations. The city Chief of Police, the CD Director, the County Coroner, a
State Police officer, and the County Sheriff emerged as a new group in that
situation. Without any prior planning, and agreeing among themselves that the
legal definitions of authority did not have to be strictly adhered to, this
group issued orders and generally controlled the movements of all groups in a
very large metropolitan area responding to the disaster.

In some disasters, certain groups emerge that might superficially appear to heve
a very concrete and delimited task, and as such not carrying out equivalent
activities to the coordination and control functions I have just mentioned. I
have in mind the sometime self-labeled "search and rescue teams." These groups
are quite conspicuous in the early stages of a catastrophe, and typically are
composed of persons with formal and informal membership in a vast variety of
pre-emergency groupir s. In one disaster studied by DRC, the core of a very
key emergent group ot this kind consisted of a city building inspector, the
manager of a bill collection agency, a business agent in a union, and a skilled
construction worker.

More important than diverse group composition however, is that from a broader
perspective, such groups can be seen as gathering and assessing information
about the state of the impacted community. That is, apart from what the group
sees itself doing, it is actually providing an information input that is crucial
before overall community emergency responses can be fully generated. Prior
information about casualties, property losses, and continuing secondary threats
is clearly necessary for coordination and control of a collective effort to cope
with an emergency. In other words, from the community level search and rescue
efforts really provide an information feedback on how badly the community has
been damaged by the disaster. It is of interest in this light to observe that
the four man "search and rescue" group I mentioned above named themselves at
different points during the emergency the "damage control group" and the "disaster
control office."

One would have to exercise a tremendous amount of imagination to see such kinds
of "search and rescue teams" as anything other than emergent groups. Partici-
pants may and sometimes have had personal links before the disaster, but they
have not operated together as a functioning work group. The relationships of
the members and the norms governing their behavior evolve as they work together.
The activity itself--narrowly seen as searching for victims, or more broadly as
an information input to the community--is clearly a new requirement generated
by the disaster. Again, it should be clear why Type IV groups are classified
as emergent groups with non-regular tasks.

The DRC data barely hint at the number and possible sequence of emergence of different kinds of Type IV groups. There is some indication, however, of shifts in kinds of membership as the immediate emergency passes. For instance, it is as members of Type IV groups that representatives of state and federal agencies sometimes play their greatest part in disasters. That is, generally speaking, extra-community public and governmental organizations seldom send large blocs of their own personnel to a disaster site. Whether it be the Office of Emergency Planning, the Small Business Administration, the U.S. Public Health Service, or the office of the state governor involved--the number of their representatives on the scene is very small indeed. Most times such persons merely attach themselves to a local Type I group.

However, there are times when representatives of extra-community organizations join together with certain local community officials. Whether formalized or not, together they act almost as an ad hoc committee dealing with longer-run relief and rehabilitation problems in the community. In this sense, such emergent groups could be viewed as being Type IV.

Other researchers have also commented on the emergence of these kinds of groups. Prince[1] in the first systematic study of community disaster almost half a century ago, noted how a Citizens Relief Committee helped by outside experts emerged and took over most of the rehabilitation activities after the Halifax explosion. Barton, in his more recent review of the literature,[2] alludes to a number of other similar cases of both a formal and informal nature. The observations of both Prince and Barton that the emergence of coordinating groups in disasters is not a peculiar feature of American society, is likewise supported by a DRC team, who found an excellent case of coordinating groups at the national level after the 1964 Chilean earthquake.

I indicated earlier that the presence or absence of all four types of groups might be used as a possible indicator of the magnitude of the disaster that a community is undergoing. Let me quickly add that the remarks that follow are far more speculative than what I said earlier. In fact, the information may not hold up under more intensive scrutiny and research. But, I cannot help but feel that there is some kind of relationship, direct or indirect, between the types of groups we have discussed and the degree of threat or danger that faces a community. And it is the community system I am speaking about here, not individuals or even organizations.

I believe it might be said that if only Type I organizations are in operation, there is no community emergency. In a way, Type I organizations represent the first line of defense against community-wide threats. To the extent such organizations alone can cope with the danger, the bulk of the on-going routines of

1. .. H. Prince, Catastrophe and Social Change, New York: Columbia University Press, 1920.
2. Barton, Social Organization.

community life can continue. Thus, even simultaneous traffic wrecks or con-
current fires in a metropolitan area can be readily handled by the local police
and fire departments, general hospitals and several of the utility companies.
No other groups need get involved to maintain normal community activities. If
the established organizations with manifest emergency tasks can handle the
difficulties, there will be no community-wide problem, and in this sense no
real disaster in that system.

The indication of at least a minor community disaster is suggested by the
presence of Type II groups carrying out latent emergency tasks. For one thing,
Type II groups are the second line of defense, or stand-by social mechanisms,
available to cope with anticipated community needs in the event of danger. The
activation of such groups is an indication that Type I organizations carrying
out traditional emergency tasks are unable to cope with the threat to the
community. In addition, the moving into action of Type II groups, their emer-
gence as new groups of necessity partly disrupts routine community life. If
Type II groups operate on any scale, they have to incorporate persons (either
volunteers or draftees) who would otherwise be carrying out their everyday
occupational roles, and so forth.

When Type III groups get involved in the activities mentioned, it is an indi-
cation that the normal and stand-by social defenses of the community have not
been enough to contain the threat. The community has had to mobilize other
groups besides those specifically geared, at either a manifest or latent level,
for possible emergencies. In fact, the presence of Type III groups means that
an attempt is being made to utilize existing groups for new and unanticipated
problems threatening the community. Conversely, Type III groups can become
operative in emergency operations only because whatever the danger, it makes
their normal activities irrelevant, unimportant or temporarily expendable under
the new circumstances. Looked at in either way, there clearly is substantial
disruption of many community-wide routines. At a minimum, community use of Type
III groups suggests a disaster of moderate proportions.

The emergence of Type IV groups, however, seems a clear indication that the
community is undergoing a major disaster. The presence of such groups means
that a community has found it necessary to create or develop new groups for new
community-wide required tasks. Apparently in certain situations the threat to
the community cannot be handled by established groups (even with some of them
assuming new tasks) and supplemented by emergent groups with latent emergency
tasks. In one sense, if Type IV groups emerge, it can be said that there has
not been anticipation of an emergency task and consequently of the necessity of
a particular group to carry it out. Somewhat metaphorically, we might say that
in a major disaster, necessary community tasks seek groups and Type IV groups
emerge to meet that need.

Although I said earlier my remarks were going to be theoretical rather than
practical in perspective, I would like to note one planning implication in what
I have been saying. This is that perhaps planning ought to be directed towards

reducing the necessity of Type IV groups and decreasing the problems of Type II groups. Some of this, incidentally, happens through experience. Although DRC data on this are quite limited, we have observed the following. In one area, a Type IV group involving the same personnel was generated a number of times by a series of recurrent threats and dangers to a community. This group now seems to be evolving into at least a semi-Type II group, that is, an established group with an identity and name, and sets of expectations of how the members will respond in a future emergency. That amount of change in community organization is in process.

Could Type IV groups be completely eliminated by planning? The one major effort that I think I have seen along this line has been in Japan. I said "I think" because tne analysis of the one disaster DRC studied in Japan, the Niigata earthquake, is far from complete. My initial and surface impression from field observations, however, is that the overall national disaster plan in Japan certainly encourages the development of what we have called Type II groups. The plan apparently attempts to allocate to them as latent emergency tasks many of the coordinating, control, and information functions Type IV groups typically undertake in American society. On paper this looks good; how it works out in actual practice is an open question so far. I personally doubt that all Type IV groups could be eliminated by planning. Plans cannot generally go beyond specifying the official structure of a group, but there is more to group structure than a set of formal roles and rules.

Our discussion of the presence or absence of the four types of groups as an indicator of the magnitude of a disaster, is clearly an attempt to go beyond identifying a disaster as simply a physical event. For most purposes, physica.. phenomena such as a tornado funnel, the water in a flood, the shaking land in an earthquake, the wind and water in a hurricane--all these things have limited usefulness for identifying the human and social problems associated with such phenomena, I have suggested defining a disaster for this purpose in terms of the collective responses of a community. I believe this will get us further if we are interested in social rather than physical phenomena.

Proceeding in this way we could also ask: Is the magnitude of a disaster corre- lated with the degree of stress a community is undergoing? Obviously, the answer to this should come out of research rather than speculation. But leaving that aside, it seems reasonable to suppose that there is some correlation. If stress is thought of as a relative imbalance between demands imposed on a community by a danger, and the capabilities the community can muster to cope with the threat, some points would seem to follow. For example, the presence of Type IV groups (emergent groups handling unexpected tasks) certainly suggests that demands must have at least temporarily exceeded capabilities. Since it was not my intent to deal with these matters in detail, I will say no more about this. I just hope I might have suggested to you how organization--the first word in the title of our topic--might possibly be related to stress--the second word.

In conclusion, the complex organizations and the voluntary associations that operate in disasters (our Type I and II groups) are relatively easy to see and to find. They have a pre- and a post- disaster existence of some kind, a name, relatively identifiable members, and so forth. Consequently, they become the focus of attention both in theoretical research and practical planning. My previous remarks are intended to suggest the usefulness of a somewhat wider perspective. Because the phenomena is difficult to study and does not lend itself well to control is hardly a valid reason for ignoring it. I would in no way suggest any less attention to Type I and II groups (for our knowledge and planning about them is little enough), but simply urge more attention to Type III and IV groups (where our knowledge and planning is almost non-existent). Such a broad approach in both theory and practice would give us the kind of information I believe is necessary for any real grasp of the topic of this symposium--emergency operations.

II. JURISDICTIONAL PROBLEMS AND MUTUAL AID TRENDS
Andrew S. Bullis*

The inadequacies of the present pattern of local government jurisdictional boundaries and of the allocations of functional responsibility to these governments are widely recognized. Students of inter-governmental relations, administrators at every level of government, and the public are increasingly aware that today's urban problems demand solutions which cannot be found and applied within the context of each unit of local goverument acting as a complete and self-contained entity.

Major metropolitan areas consist of hundreds, even thousands, of cities, counties, boroughs, villages, towns, townships, school districts, authorities, and other special districts. Even the lesser metropolitan areas present a baffling array of constituent governments of such complexity that a working understanding of how things get done, or can get done, in each area demands separate study and a rationalizing prescription tailored to the needs and particular preferences of the publics who make up each area.

The problems caused or complicated by this archaic jurisdictional pattern now transcend those usually associated with the traditional municipal "housekeeping" functions and responsibilities. The thrust for the "Great Society" through programs dependent upon cooperative or creative federalism is being blunted and frustrated by the weak structure and non-professional quality of many of the local units that ultimately must exercise responsibility. Local governments tend to be limited in powers, in functional jurisdiction, in geographical jurisdiction, and in resources--both financial and personnel.

This fragmented jurisdictional pattern of local government remains extremely resistant to change, in spite of its widely recognized shortcomings. The myths which have grown up around our cherished Jeffersonian and Jacksonian concepts of government and "grass roots" democracy are enduring when they are reinforced by rural and suburban values reflected through state legislative bodies apportioned to favor these groups and minimize the influence of growing urban populations. Hopefully, the court-ordered reapportionments now taking place throughout the nation will provide an opportunity to modernize both the substantive powers of local governments and the areal scope of local jurisdictions. But for the immediate forseeable future, radical changes in the existing patterns of local government will be both isolated and infrequent. Demonstrations of legislative enlightenment in making grants of authority to local governments commensurate with the responsibilities they face may remain rare for some time.

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The concept that civil defense and emergency preparedness be built on the base of the self-contained and self-sufficient local community, able to supply its own needs and sustain itself without support from outside its own borders for a period of 30 days following a nuclear attack, was compatible with the system of local government within which it was to operate. Indeed, it appears ideally suited to such a system, at first glance. But it is a concept which does not serve well the requirements of the fallout shelter program and is a needlessly limiting concept.

Shelter spaces are found, for the most part, in the cores of the central cities Shelters are needed in the outlying reaches of the city--in suburbia and the urban fringe. These areas are governed by local jurisdictions not responsible to the central city. To optimize the benefits of fallout shelter, population should be spread out, not concentrated in the core. Post attack recovery depends on surviving resources; resources in manpower and equipment. The fringe jurisdictions have little of either. Civil defense and emergency preparedness pre-attack planning, shelter utilization planning, must be carried out for metropolitan areas that embrace a whole host of local jurisdictions if the plans are to make sense--if they are to be effective. Indeed, the smaller units of government do not have sufficient resources to plan effectively at all. They do not have the capability to staff and support a viable civil defense agency to build even a limited civil defense system. Even the units of general government, as distinguished from the special districts and townships, are frequently governments of such incomplete scope of functions and competence that they can attempt to meet only a narrow portion of what should be a balanced or symetrical emergency operations system.

Fortunately, even under the present structures, jurisdictional patterns, and limited powers of local government, civil defense need not be limited in concept or practice to the self-contained community. Although local officials and the publics they serve still will strive mightily to retain the separate identity of their unit of local government, the walls of extreme parochialism are disintegrating all over the United States. The dramatic accomplishments of consolidation such as the Nashville-Davidson County, Miami-Dade County, and Baton Rouge get the greater share of public and professional attention. But for every one of these successes there are dozens of careful studies in other places followed by defeat of the recommendations by local electorates. The more significant developments have been the small victories, the quiet victories-- the moves toward integration that are accepted by the local officialdoms affected and which do not go before a local electorate for referendum approval. These are the victories which result from the prudent application of the "art of the possible." They are achieved by the politico-administrative process described by Charles E. Lindblom in his article, "The Science of 'Muddling Through'." They do not represent complete rationalizations of systems no longer rational. They are steps in the direction of such rationalization and help prepare the way for ultimate governmental federations or consolidations.

The contract system prevalent in the Los Angeles area--known nationally as the Lakewood City plan--is one of these steps. The Council of Governments idea-- typified by the Association of Bay Area Governments in the San Francisco area-- is another. These schemes offer immediate solutions to recognized problems without doing violence to the very existence of the participating governments. Local officials are receptive to such plans and we can expect their use to grow more prevalent and the functions handled by them to increase in number. They are being studied and promoted by the Advisory Commission on Inter-Governmental Relations, the National League of Cities, the National Association of Counties, and all of the specialized professional associations of local government offi- cials.

Civil Defense can and should capitalize on this climate of acceptance to improve and integrate emergency preparedness programs at the local level--the operating base of the programs. The National League of Cities found that among the 5 6 most populous local government units in the United States there are already 101 joint, inter-governmental civil defense agencies. These have largely come into being with no concerted program encouragement from the Federal or state govern- ments. They are the result of local initiative and permissive state legisla- tion. If the Federal Government were to promote their development by guidance and financial inducements their use could become universal.

Three distinct approaches to local government jurisdictional reorganization appear to lend themselves to the area-wide performance of civil defense ser- vices because they may be instituted with relative ease and function on a intercounty and, in the first two cases, on an interstate basis. These are the inter-governmental contract or agreement, the metropolitan council, and the transfer of functions.

The 101 joint, or area-wide, civil defense agencies identified by the National League of Cities are located in 30 states and serve about 32.8 million people. Included within this number were agencies serving 43 of the 130 cities having over 100,000 population in 1960. In addition, the National League of Cities identified other types of more limited cooperative arrangements established among local government units to meet natural disaster or attack situations, including mutual aid agreements, coordinating committees, and joint plans. But the possibility of future growth and spread of this activity was verified by the attitudes of local officials regarding their role in civil defense.

Of all the functions performed by local governments, civil defense was the func- tion accorded the greatest acceptance by local officials as being subject to administration on an area-wide basis. Administration of civil defense services by an agency having area-wide jurisdiction was favored by 75 percent of 269 local officials interview d. These officials considered civil defense more appropriate for area-wid administration than any of eleven other key services, including air pollution control which is recognized very widely as a function which should be subjected to area-wide administration.

It appeared, both from the results of the direct questions and the general discussions at the conclusion of the interviews, that local officials were receptive to the area-wide administration of those functions for which they had the least responsibility, and those with which they had already had the most experience on an area-wide basis. For these functions, proprietary attachments and personal loyalties have not become fixed between the elected officials and the administrators and performers of the service. For example, the local civil defense bureaucracy is weak and the apparent potential political rewards which might accrue to the elected official because of a successful civil defense program are small. It is not an act of selflessness to give up that which you do not really possess, or that which you do not really want.

Local government officials and civil defense directors favor the formation of area-wide civil defense agencies because financial burdens are relieved and duplicate performance of civil defense services by coterminous or overlapping local government units is eliminated. In those areas where joint agencies are now organized, realignment of local government command and organizational structure for emergency operations has been accepted without apparent difficulty or serious objections from participating officials. For example, elected officials indicate willingness to accept direction from, or act in an advisory capacity to, appointed civil defense directors in an emergency Conversely, professional city police personnel appear to accept the role of working under the direction of an elected county sheriff--in an emergency.

Joint area-wide civil defense agencies are more successful in staffing a full range of civil defense services with local government officials and personnel than are civil defense agencies serving single local governments. Joint agencies provide an effective pooling of local government manpower and equipment in the event of a disaster. Certain functions--health, welfare, and hospitals, for example--usually are provided for the county; others--such as police and fire protection--are provided by cities. The two types of government units, functioning together, thus are able to complement each other.

If local civil defense capabilities are strengthened by area-wide organization-- and it appears that they are--and if local officials are receptive to their creation--and again it appears that they are--then the national program should make a vigorous effort to stimulate their organization and use. Financial support can be both the carrot and the stick. A premium rate of support might be offered to the joint agency. Support might be withdrawn from the small jurisdiction, low performance, go-it-alone civil defense agency.

Finally, each state should enact the Council of State Governments-Advisory Commission on Intergovernmental Relations model act authorizing intergovernmental agreements and contracts--or an act similar to it. The standard interpretation of local powers is enunciated in the famous Dillion's Rule:

> "It is a general and undisputed position of law that a municipal corporation possesses and can exercise the following powers, and no others: First, those granted in express words; second, those

> necessarily or fairly implied in or incident to the powers
> expressly granted; third, those essential to the accomplish-
> ment of the declared objects and purposes of the corporation--
> not simply convenient, but indispensable. Any fair,
> reasonable, substantial doubt concerning the existence of
> power is resolved by the courts against the corporation,
> and the power is denied."

Although this chestnut is no longer treated with its old sanctity by today's
courts, today's municipal solicitors are still awed by its strictures. To get
over the hurdle of a conservative solicitor's advice and admonitions, such a
state statute is still an essential ground rule in each state seeking to intro-
duce the wide exercise of inter-governmental activity in civil defense or any
other governmental function.

The Office of Civil Defense is moving in the direction of supporting and en-
couraging inter-governmental civil defense agencies as a desired basis of
organization in support of shelter system planning and emergency operations.
Through this approach it is recognized that more viable local civil defense
staff services can be provided and the administrative effort of working with
a host of small operating units, weakly financed and staffed, may be avoided.
Uniform organizational models are not prescribed because each state and each
complex of local units has its own needs and preferences and can best devise
its own models and agreements.

Organized under an inter-governmental civil defense agency with comprehensive
and integrated emergency operations plans, civil defense may increase in
effectiveness and real substance be given to the myriad mutual aid agreements,
gentlemen's agreements for the most part, which now tie local government forces
together in an unreliable system for mutual support.

III. A SURVEY OF POSSIBLE WARTIME HAZARDS
Hal Brode*

Threat analysis can be quite complex; it is the full-time activity of a number
of people. In a brief paper one can do little more than identify major aspects
of wartime hazards. We need not spend very much time on many of the conven-
tional or non-nuclear threats, not because they aren't very interesting or
because they do not offer a wide variety of hazards, but chiefly because nuclear
weapons pose a much more serious threat to large groups of civilians. It is
true that chemicals, very toxic chemicals as well as biological agents, are
quite cheap to manufacture, but the deterrence in their applications stems from
the very difficult logistics of delivery.

It is often stated that a small amount of some biological agent or chemical
could kill everyone in the whole world--a few pounds or a few ounces or some-
thing of that sort. That is quite true, of course, if you can get everybody
to stand in line and stick out their tongues so you can reliably infect them.
That is also true of a knife; if you get everybody to stand still you could
stick them. None of which is very significant.

Really difficult problems arise in arranging reliable and effective delivery
of biological or chemical agents to a warned and uncooperative target popula-
tion. There are many problems (which we will here avoid) in lack of persist-
ence and relatively limited effectiveness of most chemical agents under such
circumstances. There are, of course, effective countermeasures--in many cases
rather simple ones--for chemical warfare, as there are also for the use of
biological agents.

It is somewhat more difficult in the case of the biological agents to identify
the agents. In fact for most of them there are no known simple fast and effec-
tive alarm or detection systems. However, in a time of imminent threat, several
simple steps may minimize the chances of exposure. Stay indoors, filter intake
air, wear simple surgical masks, etc. A warned and organized target population
leaves the planner of biological warfare with many of the same difficulties or
uncertainties as he might find discouraging in the application of chemical war-
fare to large population areas.

With biological agents, of course, there is a potentially much greater effective-
ness in that many agents multiply and spread by infection in receptive hosts
far beyond their original deposition. On the other hand, most of the known
agents are sensitive to sunlight and will not survive in the atmosphere for

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long periods of time. Even the spores, which are less sensitive than many of the virus agents, cannot be exposed for any length of time in the sunshine. Again, the unreliability in having to depend on weather to distribute them and shelter them from sunlight or having to depend on an unwarned population that takes no prophylactic measures makes biological warfare rather less significant the nuclear threat.

A further question about the objectives of a biological attack that should be pondered is: Suppose there were a successful attack and many people were made sick with some agent and in fact many people killed. What is the permanent economic impact? What has been accomplished when all the physical facilities are left intact--buildings, homes, factories, etc.? Was the objective to destroy an economy? That is less obvious, less assured, and perhaps less permanent than the effects from more violent types of attack.

There have been suggestions for using radiological debris--radioactive atomic wastes--in much the same way as chemicals or biological agents might be used against populations. This has the same set of disadvantages as those stated for chemical and biological attacks. It is as difficult to deliver effectively to each person in the population in sufficient quantity to insure a lethal or serious dose. Somewhat more effective would be the direct use of nuclear weapons as radiation distributors. It turns out that for less weight hauled to fewer delivery points, one could have more irradiation over a larger area. Particular consideration has been given to enhancing the prompt radiation from a nuclear weapon, making it less a blast and thermal weapon and more a radiation weapon. Such modification turns out in many cases not to be very convenient nor to look very attractive, chiefly because a standard nuclear weapon is very close to as efficient a radiation producer as is feasible. If one tries particularly to enhance certain isotopes ty including materials to be activated by the prompt radiations, then it is necessary to reduce its yield or increase its weight. Again for such a concept there would be big problems in delivery over large population distributions. Although delivery problems are generally insurmountable for wholesale use against large countries, many of these agents or types of weapons would have quite a different relative effectiveness in, say, field combat or tactical operations.

The so-called nuclear neutron bomb, if it were made, would still have the same delivery limitations as these chemical and biological or radiological weapons in that it is necessarily, by the physics of the situation, restricted to rather small yields of the order of a kiloton, and to small effective ranges of the order of a few thousand yards, at most. Therefore, for a large area it would be again an enormous weapon delivery problem, and again one from which the impact and the consequences would be fairly dubious. If neutron bombs were the only threat, then it would be one not very difficult to avoid. The shielding afforded in simple buried structures could be used to avoid lethal consequences, and there being relatively little accompanying blast or thermal effects, the lasting consequences--destruction or fallout would be less severe.

Even when we talk about nuclear weapons, which are the primary and the most serious threat to our cities and our populations, it is not a singular subject. There are many kinds of nuclear weapons, many yields, many delivery modes, many applications for such weapons. Concepts of weapon applications change radically as numbers and yields of available weapons change. You may remember our earliest concepts of nuclear weapons employment: When we had very few, the objectives were to attack only important strategic targets. Within 1 years after the first nuclear explosions, as our stockpiles grew, it was tentatively suggested that nuclear weapons might be used against aircraft. It was considered a rather wild idea and an extreme waste of weapons--even when it was suggested that they be used against only large mass formations of close flying aircraft as were formed in World War II in an attempt to saturate local defenses. Now of course, our fighter aircraft are capable of carrying a number of nuclear warheads for use aginst single aircraft. In fact we seriously contemplate in our designs of anti-missile systems to shoot many relatively large yield defense weapons at a single incoming reentry vehicle not knowing even whether it is just a decoy or a weapon.

The ideas regarding the uses of weapons, their applications, change with the systems designed for their delivery, and the overall objectives of a weapons system change as well. Thus, although nuclear weapons remain a threat, it is a changing threat. It has changed a great deal in recent years. Each additional country that acquires a nuclear capability forces some change in all of the following characteristics for other nuclear powers: targets, yields, numbers of weapons, their delivery modes, and their systems applications. One can expect further changes.

Just as many of these uncertainties in changing threats face the people of a target area, there are an equal number of uncertainties facing attack planners. Military strike planners attempt to minimize the effects of uncontrollable vagaries such as weather and mobile populations and whether weapons will burst on streets, inside buildings or in yards. Such factors do make a difference, of course; the weather makes a great deal of difference in where and what kind of fallout one expects, and how much thermal radiation there will be. Casualty estimates may be very poor if people with warning leave cities, find shelter, or improvise shielding and protection. But, also, rather drastic changes in effects can be due to details in the very near vicinity of an explosion. Whether it goes off on the surface of the ground or above the ground or slightly below the ground and what the nature of the ground is, whether it is concrete or rock or soil or asphalt can drastically affect the crater, ground shock, debris, and fallout. More on this subject in a moment.

A cookbook list of the kinds of effects that we must consider in various circumstances should include such phenomena as the nuclear radiation; the thermal effects, which cause fires and burns; the blast wave, which causes the major damage to structures; the cratering, which leaves a region in complete destruction even for shallow buried structures; the ground shock, which is generated

either by the cratering action or by the air blast and may damage underground structures; the after effects, such as that caused by fallout: the generation of large-scale fires; the raising of heavy dust clouds; certain amounts of wind and local weather changes; and the like. Some significant aspects of each of these subjects will be touched on in the following.

It should be noted that fallout and maximum blast effectiveness are not compatible; that is, an attack planner must make a choice between them. If he wishes to do maximum damage (for a given amount of bombs or yields of bombs) to structures, to houses, to homes, to cities, then he must choose to burst his weapon well above the surface of the ground. This is because there is a considerable enhancement in the area damaged due to shock reflections at the surface of the earth. In bursting above the surface, he will eliminate any serious downwind fallout. If, however, he wishes the "bonus" of fallout as a lethal agent and health hazard to initial survivors, or as a complication in fighting fires and in arranging evacuations, then he must sacrifice an appreciable amount of damage potential or throw a larger weapon. In any event, threat planners or attack planners must decide which effects to emphasize. For threats to large urban and suburban areas, the large yields, running to many megatons, are of greater practical concern. From large yield nuclear explosions the nuclear radiations (prompt radiations) have rather limited range. The distances to which large numbers of neutrons and gamma rays can penetrate is limited by the absorption properties of the air.

Boosting the yield by large factors does not increase the range proportionately because much of the radiation is stopped in the air. Beyond a few thousand yards there is relatively little serious radiation hazard. But, in addition to the prompt dose, if the burst is on the ground, the large masses of dust and dirt scavenge the radioactive vapors and bring down potentially lethal fallout over a period of minutes to many hours and over vast downwind areas (running to thousands of square miles). Prompt doses should be considered by those concerned with effective blast shelters; that is, when sheltering populations at relatively high levels of blast and thermal, some shielding requirements must increase. It is then important to note that there is some enhancement to the prompt radiation from large yields due to the blast wave itself. The shock removes some of the shielding air from between the explosion and the shelters allowing more of a fission fragment radiation to reach the shelters.

Figure 1 and 2 indicate the ranges for various effects from both surface bursts and bursts at altitudes sufficient to maximize blast damage to homes. On each figure, note that the vertical scale is the ground range for certain effects. The horizontal scale indicates the yields of the explosion starting at one megaton and (on a logarithmic scale) going to 10, 100, and 1,000 megatons (well beyond the range of any considered weapons today). The air burst figure shows as solid lines the range to one psi, three psi, and 10 psi (pounds per square inch). These are pressure levels in the blast. One psi from a megaton occurs at more than 11 miles from the point of burst. That represents an enormous area of coverage. One psi does some damage to homes; certainly it blows out
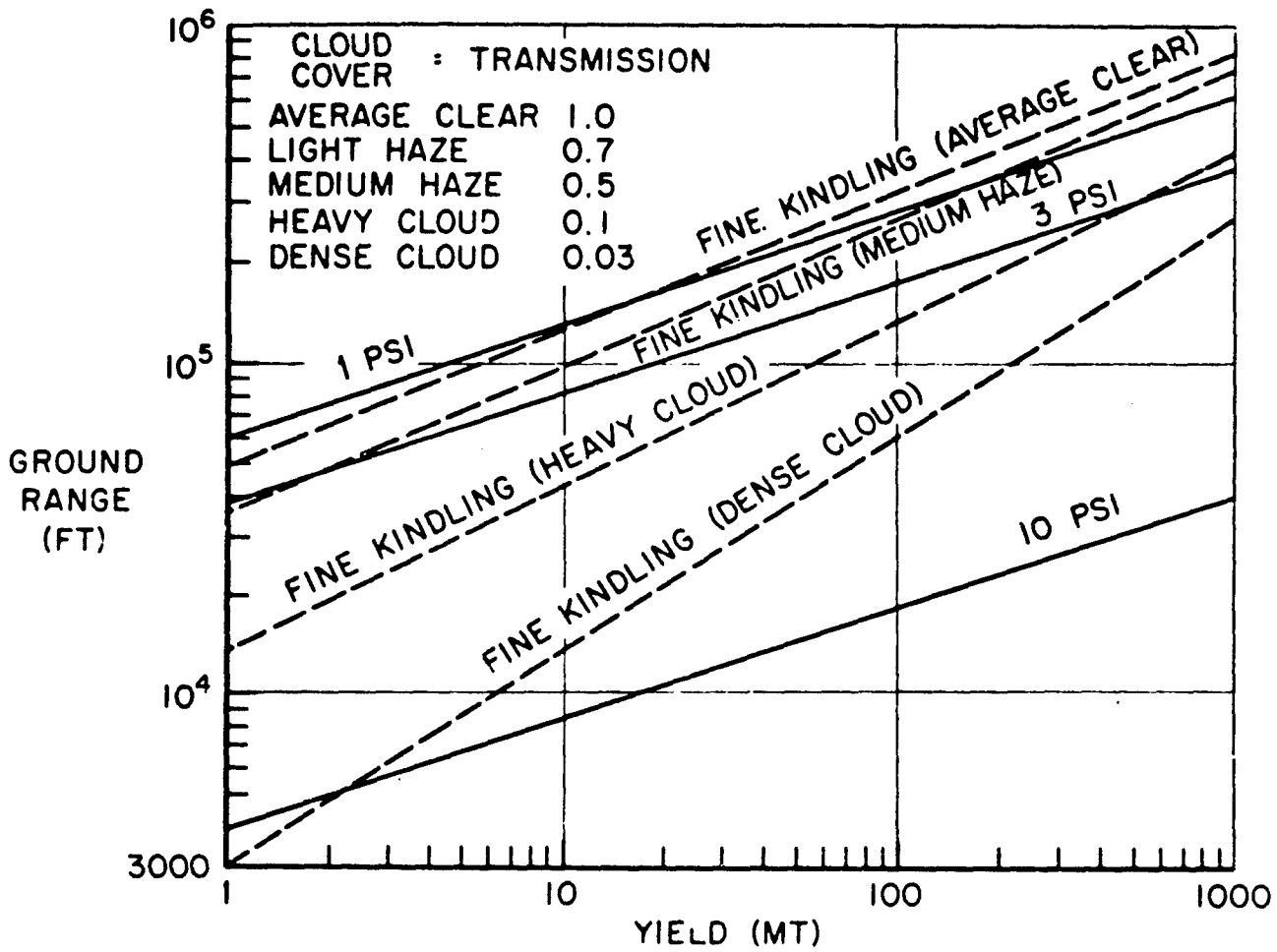
BURSTS AT ALTITUDES TO MAXIMIZE RANGE FOR 3 PSI OVERPRESSURE
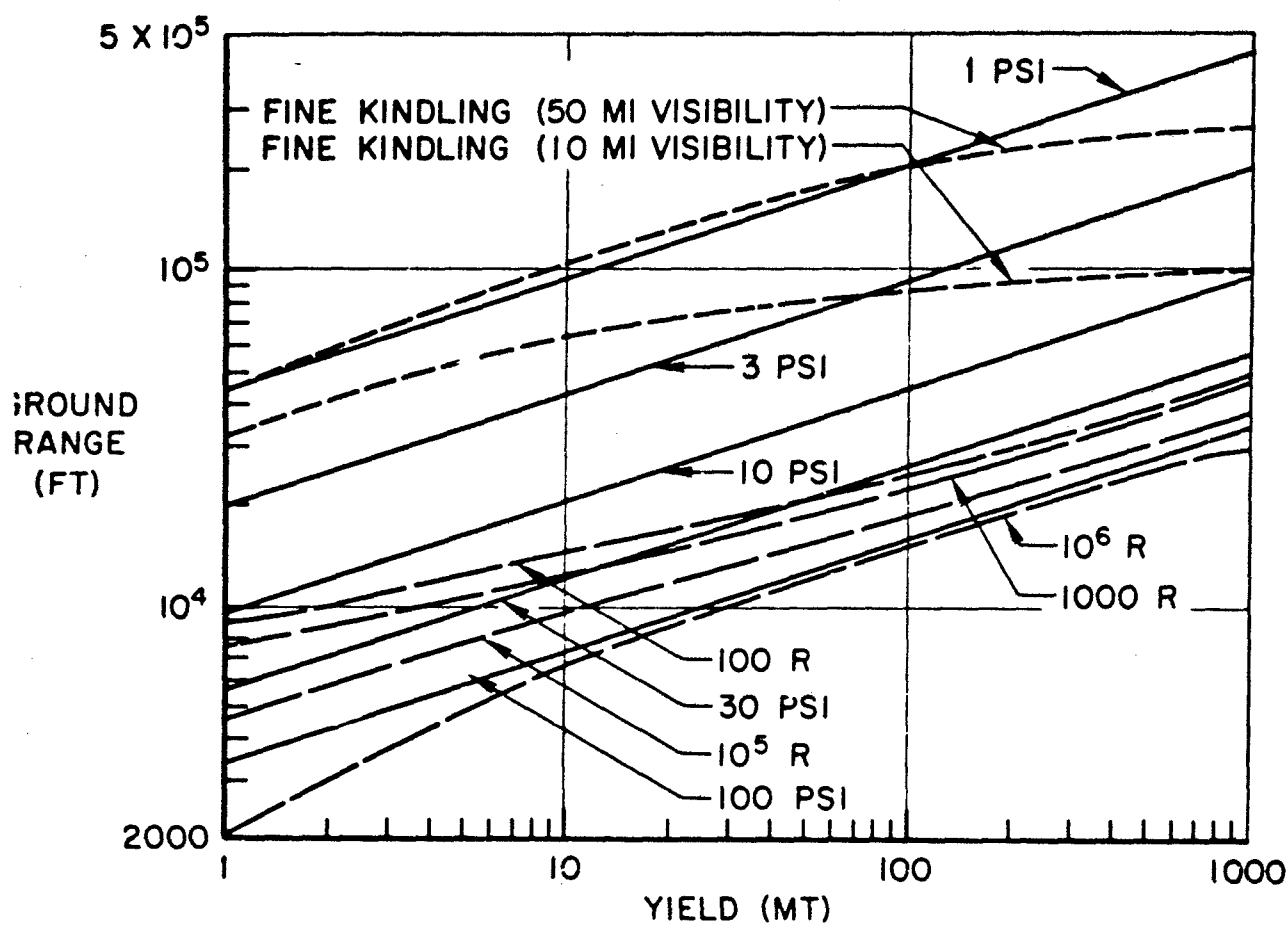

Figure 1.

EFFECTS OF SURFACE BURSTS

Figure 2.

many windows; it may also lift occasional roofs and collapse weaker structure
walls. One psi does a kind of damage that can also lead to occasional injuries
and even fatalities. Three psi is a kind of blast level that will bring down
many, if not all, single-family residential structures or at least collapse the
outer walls, tear off roofs and drive glass and splinters into their occupants.
By ten psi the commercial reinforced concrete multi-story kind of structure will
suffer major damage. Long before that load level is reached, partition walls
and windows will be blown out, and occupants would be exposed to considerable
hazard.

The dashed lines in the figures indicate the greatest distance at which the
kindling of the most receptive fuels will occur by thermal flash. As it turns
out, most materials are not readily ignited by this flash of thermal radiation.
But such things as newspaper and in general dark, thin, flammable materials
are receptive and will be ignited when exposed. So this is the range within
which one would find some fires lit. That range extends about as far out as
the one psi range. At one hundred megatons ignition threshold occurs 30 or 40
miles from the point of burst--a rather enormous distance at which one might
still expect to find fires lit and some blast damage occurring.

These ranges are for a burst that occurs in the air at a height that will
optimize or maximize the area of coverage with three psi or greater over-
pressure--a level that would insure collapse of most of the houses within that
range. Such high bursts, however, avoid any very high overpressure blast and
lead to no crater and no fallout. Figure 2 shows the same kinds of ranges
from surface bursts of varying yields. Corresponding ranges for one, three,
ten, thirty, and a hundred psi are indicated. A hundred psi is a kind of level
at which you do not find above-ground structures surviving and, if you look for
shelter it must necessarily (or nearly necessarily) be below ground. But, if
placed below ground, a hundred psi shelter is neither extremely hard to design
nor expensive to build. Recall that the official overpressure protection for
many of our missile silos housing very elaborate and sensitive equipment are
greater than 100 psi. The second figure also notes ranges for various levels
of radiation dose. Something around a hundred RAD (a unit of absorbed dose of
radiation) would be considered a significant dose, one which begins to make
people sick, while a dose well less than a thousand (perhaps 500 RAD) is con-
sidered a medium lethal dose. Shelters in these highpressure regions should
also include some appreciable shielding. The ranges for the lower pressures
(1, 3, 10 psi) in this ground burst case are appreciably reduced, as also are
the ranges to which the thermal radiation reaches to start fires. The fire
ignition ranges are smaller, since the atmosphere is generally thicker and
less transparent down near the surface, and since the source itself, the explo-
sion fireball, is contaminated with a good deal of crater material, which often
interferes with the radiation. The fire hazard from surface bursts is less
than from air bursts because the thermal radiation is less severe. Since the
blast damage is also less extensive, the blast ignited fires are also somewhat
fewer. Figures 1 and 2 show the range for various effects, but one should in

many cases consider the effective area, which would go approximately as the square of the range. Thus, from Figure 2, the affected area for one psi is more than 150 times the area covered by 100 psi.

The total thermal radiation usually amounts to something more than a third of the total yield, so if we have a nine or ten-megaton explosion, some three megatons of it will be felt in thermal, or some three-times-ten to the fifteenth calories of it can be expected to come out as heat--an enormous amount of energy in a very short period of time. The fireball source is extremely intense, many times the intensity of the sun. Sufficient heat to light dry newspaper, several calories per square centimeter, can be transmitted out to distances like 30 or 40 miles from a one hundred megaton explosion. The transmissivity of the atmosphere becomes important when such large distances are involved. Even though the atmosphere is quite transparent to the usual visible light, such energy does get attenuated some. As the sun goes down, you can easily look directly at it because of the screening effect of looking through more atmosphere. Looking directly up at the sun at midday puts the least amount of air between the sun and you, and the same source appears much brighter. For similar reasons, the thermal effects at large distances from large yield bursts may be expected to be heavily influenced by the clarity of the atmosphere.

Response of materials to thermal flash is extremely variable, and here to properly assess the fire potential hazard or the ignition hazard one should begin with some survey of the exposed materials that are potentially ignitable. In surveying many urban areas, and particularly suburban areas, it is surprising to find relatively little exterior material susceptible to ignition, and much of the ignitable matter is not susceptible most of the year. It is things within buildings that might be exposed, through windows which may be more susceptible in many cities (but not in every case). In the absence of blast, such materials can be screened or protected, and flash fires minimized. Thermally induced fires need not be a major hazard in the best of kept cities with a minimum of trash. But ordinarily there are many hundreds of potential sources within a few blocks area, so that there exists normally a potential for many ignitions occurring simultaneously. Seldom if ever have cities been faced with such densities of fire sources over such large areas, and the necessary planning for effective fire fighting and damage limiting is hampered by lack of experience on which to draw.

The high density of fire sources can lead to general and large scale conflagrations or even to fire storms. A "fire storm" is a term usually reserved for the kind of burning which is typical of a bonfire where the flames tend to merge and rise in one great column of heated air causing ground winds to blow toward the fire. Often there are turbulences that create relatively high winds inside parts of the fire as well as very high temperatures. However, the fire storm or bonfire-like action requires a high density of fuel, and much of the available fuel must be burning at the same time. If there are appreciable surface winds or wind shears aloft, then the hot column may be prevented from

forming. In most communities and in most seasons of the year, extensive fire storm action would be an unlikely consequence of thermal radiation exposure.

A fire storm, for instance, could not occur in most suburbs because the fuel that is there within structures or within buildings is neither close enough together nor immediately available to a fire to cause this kind of bonfire action. Yet the matter of many simultaneous fires or of a conflagration where individual fires merge into a fire front that spreads as a wall of fire before the wind, are holocausts with which the world has had considerable experience. There have been many historical fires; manmade (as in wartime), accidental (as in Chicago) and earthquake initiated (as in San Francisco). Consequently, the effect of large fires is one consequence of nuclear attack with which we have some experience.

In the nuclear explosion ignition case, however, the principal feature with which we have not really had much experience is the simultaneous ignition of a multitude of superficial fires over very large areas. These incipient fires in many individual points pose a problem not unlike that of ordinary firebrands in forest fires, but with several possible important differences.

Of interest also is the influence of burst altitude on the thermal effect. Down in the atmosphere, or near sea level, or for bursts only a few tens of thousands of feet above the ground, the pulse of radiation that comes from this glowing fireball is rather complex and lasts for several seconds from large yields. In these atmospheric bursts, the air acts to contain the energy for some appreciable amount of time. The air remains opaque and cannot transmit the radiant energy efficiently except in the visible light spectrum. Nevertheless, this pulse is quite effective in lighting fires, although in the very large yields it lasts such a long time that it becomes somewhat less effective. As we go up in altitude, the atmosphere is less dense and less opaque to this thermal radiation and the fireball grows to a larger size faster. Being larger, it has a larger radiating surface, so that the energy comes out in a much shorter time, and one might characterize the power versus time, or the thermal energy rate, on a time scale measured in milliseconds (i.e., thousandths of seconds), rather than in seconds as from low altitude bursts.

If one goes clear out into space, out of the atmosphere, then the radiation will be coming directly from the weapon. All the energies of the weapon come out as radiations and with no atmosphere to impede them; they come out in a very few microseconds--in a very intense, fast pulse. A thermal hazard has been suggested to stem from an extremely large yield explosion at an extremely high altitude--say a hundred megatons at 100 miles altitude. The suggestion has been that such a burst would irradiate enormous areas, starting fires within most of the area beneath the burst. Although careful analyses indicates that even with very large yields their effectiveness in lighting fires is greater if they are burst lower down in the atmosphere, such spectacular extra-atmospheric events could do a great deal of damage. The areas covered, although

quite enormous, are not so much more than the kinds of numbers we have indicated of 40 or 50 miles range from, say, a hundred megatons burst well down in the atmosphere. But any increase in area exposed to thermal flash would be at the expense of doing any significant blast damage. The question remains: What is the impact of a quick singe on an urban area, or on the whole countryside for that matter? Since this would cover farmlands as well, the thermal flash might char leaves and might start some haystacks, corn, wheat, or grass fires, but it will cause no blast damage and will create no fallout.

There are some factors that make the response of most materials to thermal insult unimpressive. If there is high moisture content, as there is in leaves when they are exposed to such a flash, they seldom burn. They smoke, flame, and appear to be burning only as long as the heat or light is on them. The expulsion of the water vapors and other gaseous elements from the leaves cools them, and flaming ceases as the light is turned off. Most foliage is simply left charred or blackened without sustained ignition occurring. You know the effects of color and reflectivity. The role that thickness of a fuel plays is the same as in the case where one trys to light a two-by-four with a match. It will not continue to burn when the match is removed or goes out. In fact, in order to burn a two-by-four, one needs to put it in a fire long enough to get it heated all the way through to something very close to its ignition temperature. That takes some appreciable time--thermal conductivities being what they are. It follows that an extremely intense flux of thermal radiation can be incident on the surface of a thick combustible element without causing a fire. The surface responds by boiling, by flaming, but there is no sustained flaming ignition after the fireball light goes out, i.e., after the thermal radiation ceases. Fuel conductivity, density, all of these things have a role to play and obviously, whether a material is flammable at all is most important in response to thermal effects.

These are easily recognizable features influencing material response and, as many of us here in Southern California are acutely aware, a little bit of weather change, some warm winds, some days or even hours of low humidity make the natural flora and the wild lands much more susceptible to ignition. This is true essentially all over the country, although the times at which high fire hazards exist are even rarer in the Pacific Northwest and in the Eastern United States. Although there are such seasons when the farmlands and the wild lands are susceptible to fires and will encourage the spread of fires, such periods occur at most only a few weeks out of the year. Even here in Southern California, hazardous conditions do not exist most of the time. It is suggested that the thermal radiation from nuclear weapons would have essentially the same kind of ignition probabilities as would occur from dropping matches. Most of the time, most of the year, you know what dropping matches is not dangerous. They go out because you are dropping them in the snow or in the rain or in the wet grass or on pavement or bare dirt or rock or damp brush. Other times of the year it is dangerous, as we know. The fire hazard from nuclear attack, can conceivably vary from relatively few to very many fires, from little hazard to a major one. Certainly, burning all of the wild lands is not possible. And much of the time, in much of the country, fires will not start easily.

Unfortunately, weather does not play so important a role for cities where there are always dry, receptive materials inside buildings. If that material is either exposed by blast or is shone on through windows, then there are potential ignition sources. Not all of the fires will be caused by thermal ignition, surely, and we have always recognized the possibility of secondary causes, that is, where existing fires have been disrupted--fires in furnaces, in water heaters, etc., where gas lines are broken and power lines shorted and arcing. However, there is lack of agreement on the relative number of such fires, relative to the number of fires started, say, by thermal ignition. This is a point of disagreement between some British authorities and authorities in this country--at least it has not been wholly resolved. Both types of fires surely are possible and should be anticipated in any nuclear attack.

The propagation of these fires and their growth into major conflagrations or fire storms is something about which we must be concerned because some thermal ignitions will occur in any complex city. The possibility of effective, quick fire fighting action should not be dismissed because the ignitions are most likely to occur in exposed, light-weight materials, and such paper, upholstery or trash fires are often most easily extinguished. Fire in a piece of paper is not hard to put out if you get to it quickly. In this case, fires start in easily identified areas in material generally exposed. It is not as if the fires would start in closets or a basement, or in the many hidden places where fires so often burn undetected until they become difficult to manage.

Knowing when and where to look, finding and snuffing out fires proved a practical answer to fire bombing raids in the London blitz, although even there not a trivial matter. So there exists some potential for effective prophylaxis in the case of thermally ignited fires, but clearly such widespread action must be in addition to the professional fire fighting operations. This is something about which householders should have some knowledge and perhaps in which they should have some training.

In the large-scale fires, if the density of burnable fuel is low or where there is no fuel, then the opportunities for fire spreading decrease. Fire growth in cities is also governed by the nature of the construction and contents of buildings exposed. The relative combustibility of European cities is generally much less than that of cities in this country because construction and design of homes there involve less burnable material; not as much wood is used, and the construction is such as to leave very little exposed combustibles. Most European buildings have thick masonery walls, tile roofs, etc. However, in this country there is a lower density of fuel, even with the greater use of wood in construction. There is an increasing use of less combustible materials, but in general we have many shingle roofs, many tarpaper roofs, and fewer tile roofs.

Fire breaks, wide street , freeways, parks, lakes, rivers, certainly have an influence on the spread of large-scale fires and if nothing else will stop them, at least the size of the target areas, the cities, or urban areas involved would limit them.

All of these considerations of the immediate effects are complicated by the possibilities of at least longer duration effects such as the fallout. The dust clouds, the rising fireball, etc., last for a matter of a few minutes. The winds die down, leaving then the potential of fallout--something which surely can be detected, if detectors are available, but which is hard to predict in detail and which will be a great worry to fire fighters and people trying to find emergency shelter subsequent to a blast. No one will be convinced that there is no chance of subsequent attacks and more blasts. Fallout and the fear of more explosions make for heavy complications for any organized effort at rescue or at minimizing damage and helping injured persons, etc.

I would like to make four points in conclusion (I don't know whether they are "points" or just reminders). First of all, the two graphs that were shown (Figures 1 and 2) do indicate something that you were perhaps aware of but is, I think, a very significant factor, namely: the extreme difference in the number of people that are at risk between a warned and sheltered and an unprepared and unsheltered population. Survival even in rather primitive shelter is certainly possible at distances of the order of less than a mile from a megaton explosion, for instance. Whereas in unsheltered situations at distances as great as ten miles they would be at risk. That is a difference of at least a factor of ten in range, but clearly then a factor of a hundred in the area affected. With a population that (at least in Southern California) may be assumed to be nearly uniformly distributed, that means a hundred fold increase in the number of people at risk and the likely number of casualties. Those kinds of factors apply to even larger weapons and certainly the factor grows as we go to more sophisticated notions of sheltering. Warning and shelter--even a little of each could prevent most of the immediate casualties that might otherwise occur from a nuclear attack.

Then a second point: I believe that in order to take advantage (in an emergency) of shelter and of any planning for such shelter, the cooperation of local people and presumably local organizations is necessary. Local planning groups, city planners, public works and police and fire officials, medical aid groups, building and safety, construction and labor groups all have contributions in their own communities toward realizing the most from each possible alternative under various emergencies of a wartime nature. The availability, and the change in the availability of shelters, even the construction or improvisation of emergency shelters, such as simply asking people to climb down into storm drains (dry most of the time) could save many lives. Perhaps under emergencies local officials would recommend such drastic improvisations for shelter, while nobody in less dangerous times would have the courage to announce official sanction of such use. When it is a matter of either being exposed to the several lethal effects of nuclear weapons or of finding some shelter in make shift fashion,

then any hole in the ground begins to look good. Some kind of consideration
should be given to such measures, but only at the local level, where there is
someone who knows where the people are and what shelter they can use and what
other facilities could be made available--down at the "field action" level,
where there is someone who knows where the manholes are, how to remove their
covers, what locks are blocking use of underground storage space and who can
open them, etc.

A point often submerged in the overwhelming complexity of such a nuclear attack
possibility is the likely range of severity of attack. The threat potential
is enormous, and it should be frightening, but there exists a wide spectrum of
possible realistic nuclear threats, by no means all of which are total cataclysms
involving the entire world and in which everything is gone forever. After all,
the blast from a single weapon lasts for but seconds; the damage may be there
for a long time but the real violence of any one explosion (and even a series
of explosions) is something which passes in a short time. Those who survive
have many problems, of course, but planning need not always successfully deal
with the most serious possible threat in order to be sensible planning. Many
realistic threats do not involve a serious consequences to communities, they
may be subjected only to fallout, but others may not even be exposed to serious
fallout doses. They may have fires started and they may be blasted. They may
have windows broken and some low levels of damage--but without some emergency
measures and some organized help, many people and much property could still be
lost. Putting it more positively: even rather low levels of disaster planning
and fire fighting and aid and rescue training can be very valuable for a wide
range of less than total disasters.

My last point is most awkward to make to a group of this calibre. In most
earthquake, flood or accidental explosion disasters, the first organized aid
and often the greatest assistance comes from outside the affected area. Many
versions of a major nuclear war would be expected to involve virtually all
communities and all areas of substantial population. Even beyond any urban
areas indirect effects (fallout, communications breakdown, general strain and
disruption from evacuees) could impose unbearable burdens on local government
and emergency facilities and pose impossible problems. When these disruptions
are most extensive covering the whole nation to some strained level, organized
aid from outside can be slow in coming, may even be less likely. Such a situa-
tion poses local problems unlike those encountered in any of our natural or
accidental disaster experiences in the past. As in the Texas City incident,
aid came promptly from outside the area. Much that was done in rescue and aid
work in the wake of that accidental explosion was done only after organizations
from unaffected nearby areas came in. That has been the pattern in many major
disasters; that the first effective organizations operating after a sudden
disaster have been based outside affected areas, or at least have started there.
When the disaster is widespread and is everywhere bad, that may not be possible
or as likely. Misery may be shared, but aid and recovery efforts most likely
to be effective could be those improvised by local survivors. Recovery and

rescue organizations may have to grow out of the ashes of prior emergency plans and training within the stricken community. Perhaps the point is that as the intensity of disaster increases, the need for outside help goes up, but as the affected area grows, the dependence on locally generated assistance must increase to compensate for the decreasing likelihood and longer wait for aid from elsewhere.

DISCUSSION OF PAPERS ON FEDERAL, STATE AND LOCAL ORGANIZATION (PANEL ONE)
                                                    Seymour D. Vestermark, Jr.*

A Broadening of Perspective: From the Local Area to the Whole Society

Hal Brode is going to be a very hard man to follow. One of the advantages of
sitting at the head table is that one can watch the audience. I sensed a marked
shift in the mood of the audience this morning. Until Brode got up, we were
talking about localized phenomena: We were talking about disasters in communi-
ties; we were talking about structures, organizations, and jurisdictions on
essentially one level of generality. Andy Bullis provided us with our first
requirement to look beyond local communities and local areas, as he sketched
the inherent weaknesses of local jurisdictions, when these jurisdictions must
respond to disasters of large scale. But Brode's paper inescapably forces us
up to a different level. We've just been through a somewhat clinical and rea-
sonably detailed analysis of the basic effects imposed by a nuclear attack on
a city or, possibly, on a whole society. The dimensions of "disaster" have
shifted: from conventionalized effects and requirements striking well demar-
cated local areas, to a group of relatively unknown, potentially interacting,
massive phenomena which appear, at the least, to involve whole metropolitan
regions. I can sense your reaction to this shift in emphasis, in your faces
as well as in the mood of the total audience to which I speak now. This isn't
quite the same audience that arrived earlier this morning.

When SDC's first speaker opened the Symposium this morning, I thought I detected
a certain subtle, almost delicious sense of anticipation: UCLA hadn't yet cut
loose like Berkeley, but they might cut loose--to provide West Los Angeles with
practice in meeting a new type of civic disaster. Another hint seemed to be
that we could withstand various other kinds of cataclysm here in the local area.
I would bet there's not a person in this room who really believes that if an
earthquake hit right now, Los Angeles could not recover from it--even though
we ourselves might not be here to talk about it. If I were to take a poll on
this subject, I'm sure we would find that many of us believe that somehow this
region would recover from an earthquake, even if the San Andreas fault were to
shift again.

I thought a bit of John Updike's story about the Lifeguard, a delightful story
that came out in the New Yorker some years ago that has been put in one of his
books of short stories.[1]   Many of us who think about preparing for disasters
of varying scope and who consider ourselves involved directly or indirectly in

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1. "Lifeguard", in John Updike, Pigeon Feathers and Other Stories, New York:
   Alfred A. Knopf, 1962, pp. 211-220.

planning for emergency operations are a bit like his lifeguard in spirit if not in appearance. During the Winter, Updike's lifeguard is a theological student in an Eastern seminary. In the summer months--the time of physical challenge and danger--he sits on a long chair by the sea. There, full of the rhetoric of the Biblical moralist and the self-praise of the elitist, he deliciously contemplates the herd cavorting on the beach. Someday, he knows, someone will finally begin to drown:

> So: be joyful. Be Joyful is my commandment. It is the message I read in your jiggle. Stretch your skins like pegged hides curing in the miracle of the sun's moment. Exult in your legs' scissoring, your waist's swivel. Romp: eat the froth; be children. I am here above you; I have given my youth that you may do this. I wait. The tides of time have treacherous undercurrents. You are borne continually toward the horizon. I have prepared myself; my muscles are instilled with everything that must be done. Someday my alertness will bear fruit: from near the horizon there will arise, delicious, translucent, like a green bell above the water, the call for help, the call, a call, it saddens me to confess, that I have yet to hear.[1]

In local disasters, the call has come and will come in the future. The nuclear case raises a much different issue. As our perspectives this morning come to include the nuclear case, we wonder what kind of call might come, what kinds of plans we might make now to deal with it, and what lessons we can draw from earlier disaster planning, operations, and studies which will help our plans and responses be more relevant to dealing with a disaster whose scope and problems none of us has experienced. In several ways, we remain a bit like Updike's lifeguard, although it must be said that the easy professional identity we get as emergency and disaster specialists begins to pale as we consider what might be required to cope with a nuclear bombing.

I think that the theme which unites the three papers given this morning has begun to unfold. Throughout the morning, there has been a gradual broadening of our perspective--first, from the Quarantelli paper to the Bullis paper, then from the Bullis paper to the Brode paper. Discussants often have functions similar to Greek choruses, who utter refrains and summarize themes; they like to leave neat bodies of propositions that you can take home. Sometimes they are supposed to be critics who can cleverly nail the methodological uncertainties in a study and show where "further research" might be done. Usually such criticism concludes with a call for more research. I am sure there will be more research. The Quarantelli work is, as we all know, one of the outstanding efforts of its kind in the country on the detailed study of local disasters. But I'm going to leave it to the audience and to the general discussion from

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1. Updike, "Lifeguard."

the panel and the floor--for which we will allow as much time as possible this
morning--to raise these kinds of questions and to provide a forum for discuss-
ing questions of method, approach, and orientation. Instead, I'm going to try
to point up some of the dilemmas and general planning problems with which we
seem to be left. I'm going to try to talk a little bit about some of the prob-
lems that are going to characterize these next several days. I'm going to do
this by posing certain questions that I'm not really going to answer. This
won't be quite the dodge that it might appear to be, because these are questions
that go to the very heart of not only emergency planning but also building a
basic social science and developing general methods for thinking coherently
about unknown futures.

If I were to point out one central proposition that emerged in my own thinking
about the papers given this morning, it would be essentially this: As we move
upward toward the level of talking about the whole society, and as we move
farther into the future in our thinking, we are faced with an increasing number
of interacting ambiguities and uncertainties. I would say that these ambigui-
ties and uncertainties seem to have a kind of temporally sequential pattern
because they unfold over time. They are patterns of contingencies which create
other contingencies. Furthermore, among them there are certain things that we
know we cannot fully know now about an unexperienced time in the future. Not
knowing these things, we can't know certain other things that are farther into
the future in time.

Now, in moving from the level of the local area to the level of the national
society as the focus for pre-emergency and pre-disaster planning, we magnify
the basic temporal uncertainty. Existing or desired states of the whole
society and social system now becomes the measures--or "criteria"--of the
effectiveness of our emergency plans, systems, and operations. Indeed, we
begin to experience the need to employ an emerging "societal criterion" to
guide our thinking. In projecting this complex societal criterion forward
toward future times which are increasingly distant from the present time, we
intensify the effect of the uncertainties which result from the interdependence
of uncertainties over time. We do this by using concepts of "region," "social
system," and "whole society," which, in the present state of knowledge, may not
be fully complete and adequate to our needs, and yet which do imply that larger
physical and social areas within complex society must be understood as more than
simple summations of effects and processes occurring in localities. Since our
methods and concepts for describing present-time social life beyond the com-
munity level contain their own chracteristic uncertainties and shortcomings,
these uncertainties must be intensified when we project imperfectly described
forms of social life forward in time and, in doing so, subject our descriptions
of events in society to the additional uncertainties inherent in trying to
describe and understand the contingencies that exist among events occurring in
a temporal progression.

In short, trying to move up from the community level to more general levels of society is a difficult enough task when conducted in the present time. But when the results of that effort are projected forward through time, in an attempt to create a "societal criterion" more adequate to expanded emergency planning and operational requirements, we have compounded the uncertainties. Here, the tasks of those who must plan for nuclear disaster occurring in a whole society merge with those of the social scientists who are trying to develop comprehensive but manipulatable theories and models of the whole social system.

Some Easy Fantasies

Looking back over the specifics of this morning's papers, I am struck by how research findings can offer obvious but misleading clues toward steps that might be taken in emergency operations. For example, one of my initial feelings in reacting to the Quarantelli paper was that Type I groups should be required to be less rigid when confronted with the requirements of emergency operations. Here you have this wonderfully tight, bureaucratically organized structure! You've got men who are disciplined through specific training for emergency assignments. They have regular personnel assignments with a stable structure which resists disintegration under stress. Why in Heaven's name couldn't Type I groups do even more, under conditions of really massive, sustained disaster! Why are they so intractable to expansion of their missions? A fleeting impression across my mind was that perhaps military units and the local community structure of bureaucratic, hierarchical units for dealing with disaster should have some general broadening of leadership perspectives and organizational functions--and some specific new assignments. Perhaps these organizational forms could be generalized into nuclei for total "disaster management systems."

But, a little later in the Quarantelli paper came the point that this limitation of function, which occurs as a result of functional demands within the tightly organized, hierarchical group, is a critically important, purposive constriction, a kind of drawing back from over involvement in the total crisis situation--which has to occur if the organization is to continue at all. Even in the local area experiencing more familiar types of disaster, there are kinds of disaster situations which could totally tax the capacity of local Type I groups to respond. A potential dilemma to be resolved by the planner begins in the contradictory implications of the knowledge he may have about Type I groups. On the one hand, he may realize that it is structurally unsound to broaden the missions and responsibilities of Type I groups. On the other hand, their coherence and stability under stress may make a broadening of their missions and responsibilities to appear not only attractive but necessary. How is the planner to take full advantage of existing, stable Type I structures, without so taxing them that their leaders come into conflict with emergency planners and operations chiefs, or--in the most extreme cases--that they collapse as functioning groups?

Their structure makes Type I groups among the most crucial nuclei of social organization to have in a community experiencing disaster. On the other hand, the functional requirements of maintaining these particular structures so that their members can perform particular, mission-oriented tasks appear to be necessary constraints on expanding the missions and functions of these organizational forms.

Fantasy resolutions of complex problems can come when we fasten upon one set of elements in a potential solution, to the exclusion of other elements which create the conditions for the elements we would like to choose. Part of what one could call "fantasy solutions" to future problems of emergency operations is simply to assume that the structure of Type I groups permits us to keep adding to their load.

At the same time, I found myself very tempted to ask, "What could we do in predisaster or pre-attack planning to encourage or broaden the growth of Type III and Type IV groups?" These, you recall, are established or emergent groups which respond to the developing functional requirements of the disaster situation by assuming and performing particular tasks. They are groups whose functions in coping with disaster evolve in the emergency situation; among their functions are activities that can't be fully planned in advance. I was struck here, again, by a kind of pressure toward fantasy in my thinking--a pressure toward the fantasy of trying to find some way of planning and determining the environment of the future now, by trying now to find things that could be done to increase the likelihood that these kinds of groups would form and expand rapidly or would more quickly express latent potentialities as manifest functions. One of the problems that we have in all our thinking--whether it be pre-disaster, pre-attack, or post-disaster and post-attack thinking--is that we are inclined, for the wrong reasons, to want to overdetermine some of the events that might occur. If the functional situation of a society or a community in disaster is such that there are pressures conducive to the full emergence and functioning of Type III and Type IV groups, it may be that all we can do is release these pressures as they occur and allow these groups to form "naturally". It may not be possible to plan in advance for particular configurations of these groups to occur.

It may be useful here to take a comparative perspective. If you compare our own patterns of local community control with, for example, those of the Soviet Union, you find that the Soviet Union, which has relatively more coordination and administrative integration, must build into its own social and political system methods for permitting organizational flexibility and individual initiative under stress.[1] Through the use of the local party apparatus, certain

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1. For a discussion of these features of the Soviet system, within a larger consideration of both Soviet and American dilemmas in responding to the thermonuclear attack, see Howard R. Swearer, "Local Government in the U.S. and the U.S.S.R. under Stress: (This footnote is continued on the following page.)

categories of relatively unhampered official "generalists," and flexible local organizational methods and structures, the Soviet system has tried to find ways for institutionalizing flexible responses to ambiguities and uncertainties. The need has been to create enough flexibility in the total system so that when something unexpected happens, there can be relatively non-ideological, unconstricted responses possible within certain broad ranges of latitude. A constant rhythm in the Soviet experience has been the creation of a certain flexibility of procedure and response during times of mounting crisis, followed by increasing administrative rigidity and ideological dominance as the crisis or disaster came under control, followed by increased flexibility during times of new crisis. In examining the Soviet experience, the American planner can see the dangers in trying to overdetermine not only future responses but also the basic characteristics of the future situations which require particular responses.

There is a kind of analogue, in fact, between certain American intellectual and planning styles and the Soviet administrative and organizational style. If we compare our own thinking about both social theory and the requirements of pragmatic, immediate planning with the structural example provided by patterns of Soviet administration, I think we can see that in theoretical speculations as well as in our specific models of the future, we sometimes experience pressures toward rigidity, comprehensiveness, and closure which are similar to the pressures existing in the formal Soviet system of control. Both Soviet administrators and American planners must learn to be flexible in living within their administrative or intellectual models: flexible in allowing events to unfold; flexible in allowing these new events to create their own pressures, which will in turn stimulate the emergence in sequence of new group forms and structures to meet various categories of new and unexpected needs. One lesson of the comparative perspective is that the intellectual systems and models used by planners in a free society can sometimes be as exhaustive and as rigid as the concrete administrative forms used in a totalitarian society. It would appear that intellectual systems and concrete administrative forms can, through different channels, structure and limit the unfolding of future realities in equivalent ways.

A Comparative View of Some Political-Administrative Dimensions of Nuclear Attack," in S. D. Vestermark, Jr. (ed.), Vulnerabilities of Social Structure: Studies of the Social Dimensions of Nuclear Attack (McLean, Va.: Human Sciences Research, Inc., forthcoming in 1966), pp. 459-531. On the tension between official ideology and organizational forms in the Soviet Union, see, for example, Barrington Moore, Jr., Soviet Politics: The Dilemma of Power (Cambridge: Harvard University Press, 1950).

Organizational Problems in Using the "Societal Criterion"

Assuming that a "societal criterion" adequate to planning for emergency opera-
tions under massive disaster could be stated, how would it be used? Here I
want to talk a bit about the progression from the Bullis paper to the Brode
paper. The Brode paper builds on the Bullis paper, in the sense that Brode
showed implicitly how the technology of nuclear weapons effects further in-
validates the pattern of local jurisdictions and administrative arrangements
which Bullis had shown to be increasingly irrelevant to both the normal and
emergency needs of local, regional, and national political communities. Bullis
effectively and clearly pointed out that many local patterns of jurisdictional
and organizational arrangements which constitute the framework for responding
to disaster today are simply not functionally viable now. In a post-nuclear
attack setting, they will be even less viable. The magnitude of the potential
disaster effects outlined in the Brode paper requires the planner to confront
directly the question of how he can think and plan in terms that go beyond
local communities and local political jurisdictions.

In beginning this sort of thinking, we must look at one of the peculiar anoma-
lies built into our thinking about issues that must ultimately be defined at
the national level. This anomaly is the separation of functions between the
Office of Civil Defense (OCD) and the Office of Emergency Planning (OEP). It
acts as a subtle constraint on attempts to formulate particular emergency plans
and systems designs which are explicitly related to national or "societal cri-
teria" of feasibility, effectiveness, and relevance.

In a peculiar but real sense, OCD is a kind of body without a head, having as
it does responsibility for systems for protecting the population against the
effects of large scale disaster, especially nuclear weapons effects, but being
denied access to the process of stating the full range of criteria which specify
and measure the ways in which the whole society (beyond some simple arithmetic
summation of individual persons) is protected. On the other hand, OEP is a kind
of head without a body, in that it is a principal repository of plans, data,
and procedures for managing the whole social system under great emergency.
Indeed, it might be said even more generally that OEP is potentially the central
repository of usable information and ideas about the basic structure of the
whole society. OEP's information banks, plans, and management and control
systems are to be used in managing a number of critical recovery tasks in both
severe local and severe national disasters, yet the actual body of systems for
protecting and managing the human resources of the society is under the juris-
diction of OCD. OEP has access to the critical information, decision criteria,
and some of the material resources which the "body" must use; at the same time,
OCD has the short-term responsibility for the "body" of "survivors-in-systems"
which must be guided through emergency and crisis conditions. But under condi-
tions requiring far-reaching and complex disaster management and recovery opera-
tions, the "head" must be able to guide the "body," just as it is ultimately
the "body" that sustains the "head."

How to join the "head" to the "body" in this situation is, I think, one of the most serious institutional problems that has to be faced in even beginning to think about the kinds of societal criterion questions that grow from simultaneously considering the empirical possibilities of local disaster organization reported by Quarantelli, the local jurisdictional and political problems outlined by Bullis, and the technologically feasible consequences of nuclear weaponry explored by Brode. It may be that this institutional problem can be solved in analytic terms long before it can be solved in political and administrative terms.[1]

Interactions of Practical Planning Problems in Metropolitan Emergency
Operations: An Illustrative, Hypothetical Case

Deferring the problems of stating and using criteria of emergency planning and operations which are stated at the level of the whole nation or social system, what can we say about the particular social organizational problems which confront those who must plan for a really large disaster in the future? If we revert again to a narrower perspective, some particular issues may emerge with greater clarity. How do we plan to cope with them?

I think we can go through a little exercise here at the board which might be of some interest.[2] I'm going to discuss very briefly some of the general social problems and particular organizational problems in creating emergency plans to reduce the vulnerability of the population of Washington, D.C., to several forms of large scale disaster. Some of Washington's particular attributes and problems make it especially salient to the subjects of this symposium. Not only is it our capital city and a point where power processes in our society converge, it is also a complex metropolital population, with a distinctive and significant arrangement in physical and social space.

1. The present discussant has elsewhere addressed some of these problems of stating the "societal criterion". See S. D. Vestermark, Jr., "Social Vulnerability and Recovery as Analytic Problems," in S. D. Vestermark, Jr. (ed.), Vulnerabilities of Social Structure: Studies of the Social Dimensions of Nuclear Attack (McLean, Va.: Human Sciences Research, Inc., forthcoming in 1966), Ch. I, esp. pp. 154-184.

2. At this point the discussant stepped to the chalkboard and began to draw an outline map of the District of Columbia. This outline map has been included in these symposium proceedings in a more refined form, as Figure 1. The figure here includes more detailed information on metropolitan geographic locations than was sketched freehand before the actual symposium group.
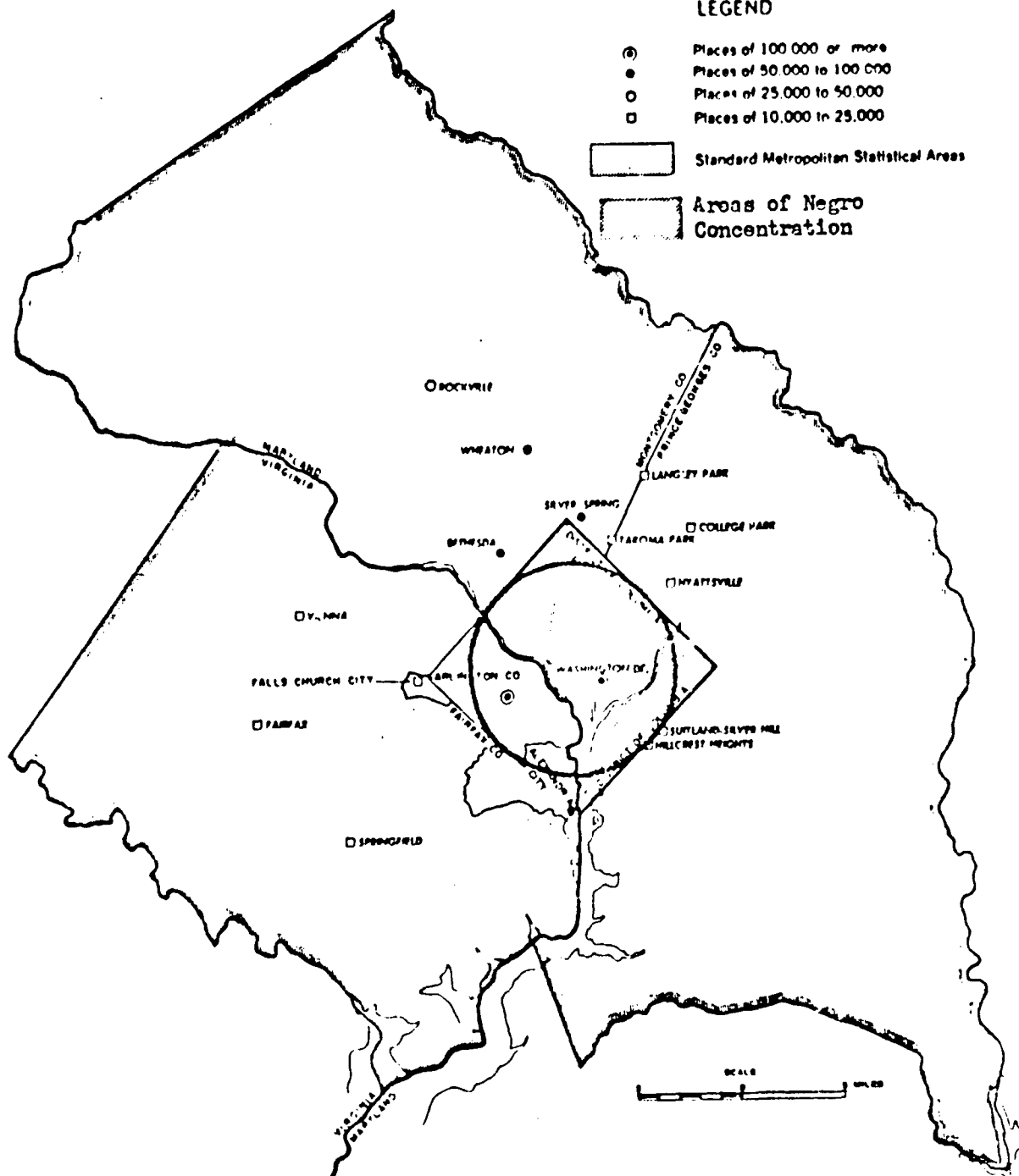
Source of Original Map: U.S. Bureau of the Census, U.S. Census of Housing: 1960, Final Report HC(1)-10 (District of Columbia) (Washington: U.S. Government Printing Office, 1962), p. 10-3.

Figure 1. Washington Standard Metropolitan Statistical Area, Showing Areas of Greatest Concentration of Negro Population and an

If we were to build a bit on Hal Brode's paper and consider this city as the target of nuclear attack or major related emergency, what would be the critical problems of social organization, from the point of view of those who would have to plan for emergency operations? The District of Columbia today forms the largest portion of the original "National City Square," which once included the contemporary Arlington County, Virginia, and portions of the City of Alexandria, Virginia, before they were returned to Virginia in the Nineteenth Century (see Figure 1). The center of the original square can be easily plotted, by intersecting its two diagonals. It falls near the White House. Assume for the moment that a nuclear device were targeted so that it exploded over this geometric center. Assume, furthermore, that for various reasons we had tried to reduce the vulnerability of the Central City population by relocating it outside a certain radius. Let's say that a circle of five miles radius, described from the geometric center of the old National City Square, includes the total area from which we plan to move everyone to outside, relatively secure locations. You will see from the figure that the area included in this radius touches the sides of the square, to include most of present-day D. C. and Arlington County.*

This rough a model may be sufficient to help us see certain organizational problems more clearly. One of the first problems that the emergency operations planner has is in confronting the consequences of the highly distinctive distribution of population characteristics by local areas. The area I have crosshatched in the figure is, as those here are familiar with Washington know, approximately the "Northeast" and Southeast" parts of the District of Columbia. In the Washington metropolitan area, this crosshatched area is the center and largest concentration of the Negro population. Here we get into one of those issues that is so difficult to raise, but which needs to be raised, especially at symposia of this sort. In the 1960 Census, there were approximately 487,000 Negroes in the Washington Standard Metropolitan Statistical Area, the basic Census measurement area which includes the surrounding counties. Of this 487,000, 411,000 (the number has since risen) lived in the District of

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*During the open discussion reported below in these proceedings, the present discussant noted that this example of metropolitan Washington was only an hypothetical case, presented for illustrative purposes. While resting on a rough model of a hypothetical strategic or tactical evacuation which might have been among the kinds of plans once considered for evacuating such a metropolitan center in the face of potential disaster, the present case was presented only for the purpose of highlighting some of the organizational problems with which planners--and, potentially, operators--must contend.

Columbia--the northern and larger fragment of the old National City Square.[1]
In turn, the majority of that Negro population lives in the crosshatched area.
In addition, about 90 percent of the public school children in the District
of Columbia are Negro. Immediately across the Potomac River, the close-in
larger part of the remainder of the old National City--Arlington County,
Virginia--is predominantly white.[2]

Many of the most urgent, special problems confronting the emergency operations
planner in moving this population begin with the fact that within the District
of Columbia sector, a majority of the population to be moved will probably be
Negro, with many social welfare needs. Therefore, in relocating just this
population, it is probable that a number of urgent welfare problems are also
being translated to new settings outside the city. These welfare problems
will include giving support in some form to the approximately one in five
Negro families that have one or both parents absent. They include maintaining
continuing efforts to find stable jobs for Negroes who may be at a competitive
disadvantage in the job market. They include coping with the consequences of
relatively low level of educational attainment among the Negro population,
particularly if relocation were for a longer term.

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1. The exact figures by race for the 1960 Co   are.

	Area	
Race	Total SMSA	D
White	1,502,429	
Negro	487,	411,737
Other	12,	6,956
Total	2,001,897	763,956

   Source: U. S. Bureau of the Census, U. S. Census of Population and Housing:
            1960, Final Report PHC(1)-166 (Washington, D. C. - Md. - Va. Stand-
            ard Metropolitan Statistical Area) (Washington: U. S. Government
            Printing Office, 1962), p. 15.

2. According to the 1960 Census, Arlington County's total population numbered
   163,401, of which 154,172 were "White," 8,590 were "Negro," and 639 were
   "Other."

Some of the features of the Negro population that are associated with its wel-
fare situation will also be associated with particular problems in managing
and moving this population during emergency. For example, the lower incidence
of local community organizational and associational ties within the Negro popu-
lation, especially when this population is compared with the white suburban
population, means that it will be perhaps more difficult to communicate with
the Negro population and to mobilize it coherently. Therefore, it is reason-
able to expect confusion in short-term management and movement, just as in the
longer term, it will be reasonable to expect that in many cases, formal agen-
cies will need to step in after relocation to assist in meeting immediate sub-
sistence needs.

Beyond meeting primary survival needs, the emergency operations planner may
have more subtle challenges. Even within a white population as sophisticated
as that of the Washington metropolitan area, the planner may expect some chal-
lenges to the "legitimacy" of his emergency plans, when these plans are so
closely attuned to Negro needs. From one small but articulate sector, the
planner may even encounter open objections to special measures for the Negro
population, in view of apparent needs of other, higher status sectors of the
population (to them) that are at risk. There is an obvious enough answer to
these kinds of objections: namely, that all citizens within an area defined
according to some objective criterion of risk (i.e., within the five-mile
radius) will be treated equally. The answer rests in this case, as it always
must in similar cases, on the objective, impersonal nature of the threat, not
upon resolving competing claims for preferment.

A more important set of issues may arise when emergency planners consider re-
locating large Negro groups beyond the Central City, in areas within or near
high status, white suburbs. In several ways, both shorter term and longer
term relocations of large Negro groups near these suburbs would be quickly
executed breaches of long standing patterns of de facto residential segrega-
tion. In the shortest period after relocation, the least that will occur is
that relatively deprived groups with intensified subsistence problems will
be in close proximity to high status groups that have achieved relatively
stable solutions to meeting their life needs. If official agencies cannot
fully meet the needs of the deprived groups, where will they turn? In the
slightly longer range, de facto patterns of school segregation may come under
pressure, as Negro children enter the facilities of schools which were just
a short time before largely white. In a still longer time interval, suburban
community patterns may begin to develop among the relocated groups. Some
Negro members of these groups may seek permanent housing in previously all-
white areas. Thus, pressures toward a fundamental restructuring of residen-
tial patterns in the metropolitan area would be brought into being. Whether
unwittingly or by design, emergency planners may find their plans and opera-
tional measures becoming vehicles for longer term social change. Of course,
this observation is no more than a reflection of a basic lesson that can be
drawn from disasters and emergencies: Sudden stresses often stimulate or
provide vehicles for processes of social change.

Much of what has just been said applies not only to Washington but to many
of our largest, most densely populated urban centers. Turning from problems
associated with the racial structure of our largest metropolitan areas, the
emergency operations planner would find some special problems peculiar to the
social organization of Washington's population. In the near Northwest sector
of the District of Columbia--and elsewhere in the SMSA--you would find signi-
ficant numbers of relatively transient persons of professional or sub-profes-
sional status. Many of these are relatively isolated from primary and secondary
networks of communication and community participation. With this group as well
as among the unorganized Negro sectors elsewhere in the Central City, there-
fore, you may encounter blocks to effective communication and mobilization.

Of course, the dominance of "white collar institutions" in the Washington area
suggests that many people could be relatively efficiently reached and directed
through contacts at their work locations. Also, higher levels of skills and
education among such a population should make them a more attentive audience
to messages coming from their environment. Furthermore, the jurisdictional
problems arising from the many local political units that exist around Washing-
ton might be alleviated under times of great emergency by the local dominance
of the Federal presence and by the relative ease with which Federal agencies
could assume a dominant local role. Therefore, Washington's problems of social
and spatial stratification and of multiple political jurisdictions may not be
as serious as similar problems afflicting many other metropolitan areas which
also need to be considered as self-contained, unitary regions.

On the other hand, the kinds of regional characteristics which do shape emer-
gency plans and operations emerge clearly when one considers one other direct
consequence of moving and relocating the Central City population from Washing-
ton. If such a relocation lasted for more than a few days, workers would have
to get to their jobs--unless some way had been found for them to take their jobs
with them. Assuming their jobs had not been moved, new patterns of daily com-
mutation would evolve. For many workers, these new commuting patterns would
probably be a reversal or lengthening of their former patterns. The social
ecology of the Washington metropolitan area is based on a great many daily
exchanges from suburb-to-Central City, suburb-to-suburb, and lower-status-
Central City-sector-to-higher-status-Central City-sector. Negroes relocated
outside the Center City would probably be hardest hit as a group by changes in
commuting patterns, for it appears that for them many commuting patterns would
be totally reversed or greatly lengthened. For white middle class workers of
professional or lower status white collar categories, the consequences are less
clear, since many of these consequences would depend on decisions about whether
to move centrally located offices and agencies. If these central locations
were preserved in the short run, then the massive daily inflow from white sub-
urbs to work locations would continue. Joining this inflow would be a signi-
ficant new group of Negroes, who would be commuting "through" the white suburban
ring to Central City jobs. In more than a metaphorical sense, then, the kind
of emergency movement plan I am suggesting here would tend to "reverse" rela-
tionships which are the basis for the social ecology of the entire metropolitan
area.

My purpose in going through this map exercise has been only to suggest the specifics of some of the kinds of operational challenges confronting local planners as they start thinking in terms that resolve the kinds of issues posed by Andy Bullis. The pressue is increasingly strong to think in terms that go beyond tiny local demarcations, into regional demarcations of problems. Furthermore, you're going to have to start thinking in terms of social issues which heretofore have been difficult to raise as issues in public discourse.

Perhaps my reason for talking about the "societal criterion" now becomes a little clearer. Whether or not a social system could withstand the kinds of catastrophe described by Hal Brode is, indeed, "a question for further research." But guiding this research must be a perspective which permits taking as criteria effects expressed, first, in terms of local areas and local units and, secondly, effects expressed in criterion terms which build from local areas, toward effects expressed in terms of regional areas, and ultimately toward effects expressed on the level of the whole society. In learning to think in these terms, we will be trying to stabilize several interacting patterns of uncertainties, as they build and unfold. At the present time, however, we may be both theoretically and practically locked into a number of ineffective and non-functional ways of thinking about and approaching problems. This may be as true for those of us who are under great pressure to make practical decisions as administrators or operating officials as it is for those of us who need only think about and plan for the future, and wh. enjoy the luxuries of more time and fewer immediate responsibilities.

PANEL TWO

EMERGENCY OPERATIONS RESOURCES

I.   DISASTER AND RECOVERY[1]
Howard Kunreuther[*]

NTRODUCTION

ne of the reasons why so few economists have studied problems connectea with
imited disasters is the scarcity of empirical observations on short-term
ecuperation and long-run recovery. Perhaps an explanation as to why so little
tatistical data on economic phenomena have been collected is the negative
nage which the word "disaster" generally conjures up; in fact, economists are
ore than happy to change the subject rather than pursue the implications of
he event.[2] This is unfortunate because the cost of these unexpected catas-
rophes and the problems they have created for both the local community and
ederal government have increased in recent years and threaten to get even
arger unless some basic policy changes are undertaken. In this paper I will
ocus on some of the problems of long-term recovery following a natural disas-
er or other catastrophe that affects a limited area.[3]

fter describing the general pattern and speed of recovery from these events
y using the concept of the capital/labor ratio, I will focus on the present
ole of the federal government in post-disaster operations. Particular
nphasis will be placed on the activities of the Small Business Administration,
ie principal agency providing funds to the private sector through its "Disas-
er Loan" program. In the final portion of the paper I shall propose a system
f comprehensive private disaster insurance to cover losses in the private

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This feeling may result from the label "dismal science" which was so long
:tached to the economics profession. Whenever anyone gives me a strange look
'ter I tell him that my current work is related to the economic problems of
.sasters, I immediately point out that some of the most admirable qualities
' human nature occur after catastrophes and that from the economic point of
.ew most people have few complaints about suffering a loss since so much aid
ir recovery is forthcoming.

I have used the word "limited" rather than just "natural" disaster so such
in-made catastrophes as bomb explosions (e.g., Texas City, Texas [1947])
iuld not be excluded from our definition.

sector with federal aid being used to restore public facilities. Disaster
recovery under this program should be more efficient and equitable than it is
today.

My interest in the problems created by natural disaster began with a study of
the economic problems in Alaska following the severe Good Friday earthquake
there. To illustrate some of the concepts of long-term economic recovery, I
shall utilize specific statistical data obtained on Alaskan activity during
the post-disaster period. Although many of the actions taken in the area were
rather special and unusual, as shall be illustrated in the appropriate
sections, they do not appear to differ in kind from the response following
other disasters. We have attempted to demonstrate this in our study by sup-
plementing our analysis of the Alaskan experience with data available from
other disaster studies.[1]

LONG-TERM RECOVERY

Capital/Labor Ratio

By long-term recovery we mean the actual rebuilding process of the community
in contrast with the short-term recuperation phase which is characterized by a
critical shortage of basic necessities such as food and housing. One way of
looking at the economic characteristics of reconstruction activity is to study
the effect the disaster has on the capital/labor ratio in the area. This
ratio will not only be directly changed by the actual catastrophe itself but
also indirectly through a flow of money, resources and people following the
event. Thus, for example, at 5:35 p.m., just before the Good Friday earth-
quake, the Anchorage area had 83,000 inhabitants and an estimated capital stock
(in its most general form) of approximately $1 billion--a ratio of about
$12,000 per person. As a direct result of the quake the population was re-
duced by 115 people while the loss in capital was estimated to be over $165
million. The new ratio was thus reduced by $2,000 per person. Over a period
of time this ratio would change due to aid from the outside and rebuilding
activity (both of which would affect the capital component) and movements of
people into and out of the area (which would have an affect on the labor
component).

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1. Although there is a fairly large body of literature on post-disaster
patterns, it has emphasized sociological and psychological considerations.
However, both these elements do play an important role in shaping economic
behavior; therefore, there are some meaningful economic data that can be
gleaned from these earlier studies, particularly with regard to migration
and housing problems.

Our general thesis can be stated very simply: If a disaster lowers the capital/labor ratio--that is, results in large physical destruction but few losses of human resources--recovery will be rapid if external funds are made available. As we shall presently see, the Anchorage area fits the above description perfectly and it was thus not surprising to find that within one and a half years after the quake, reconstruction was practically complete except for some large-scale urban renewal projects in the outlying communities. On the other hand, if external funds are limited or difficult to obtain, recovery will be painstakingly slow. The disastrous Skopje earthquake of July 1963, illustrates the case of a severe reduction in the capital/labor ratio with only limited external funds available for recovery. Since the Macedonian community suffered almost $1 billion worth of damage and only a small amount of capital has trickled in from the rest of Yugoslavia, little permanent rebuilding has taken place.[1] Instead, a large proportion of the damaged structures have simply been propped up and plastered together, very frequently by the individual owners themselves, thus creating the impression of a masterpiece in patchwork.

Changes in the Capital Stock

Damage Estimates. We shall now look more specifically at the factors which affect long-term recovery through changes in the capital/labor ratio over time. One of the common phenomena which appears to occur after a disaster is a tendency by officials and survey teams to exaggerate the losses.

Looking more specifically at the Alaskan earthquake, Table 1 indicates the changes in damage estimates to state and local public facilities for the communities affected by the quake. These figures, based on Anderson Commission reports,[2] indicate a general downward trend over time. The estimates given towards the end of June still has to be considered preliminary. A more detailed analysis of Anchorage will show that the actual expenditures necessary to repair state and local facilities were considerably less than the total shown in Table 1. (See pp. 18-20)

Sources of Funds. In recent years the federal government has played an increasingly important role in aiding the recovery of disaster areas. With the

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1. Outside aid from other countries was almost totally restricted to supplies for the emergency period such as food, medical supplies and hospital units.

2. Damage estimates were calculated on the basis of current replacement cost to facilities. They were obtained through surveys by the Corps of Engineers, the Bureau of Yards and Docks and the Federal Aviation Agency.

Table 1

CHANGES IN DAMAGE ESTIMATES TO STATE AND LOCAL PUBLIC FACILITIES
(in thousands of dollars)

AREA	LATE APRIL 1964[1]	JUNE 25, 1964[2]
ANCHORAGE[3]	52,620	47,267
CORDOVA	625	237
HOMER	5,500	203
KENAI	400	10
KODIAK	2,255	2,313
PALMER	10	10
SELDOVIA	2,334	1,334
SEWARD	17,333	9,590
SPENARD	5,000	5,000
VALDEZ	4,833	3,217
"ALASKA GENERAL"[4]	12,000	14,801
TOTAL	102,910	83,982

SOURCES:

1. FEDERAL RECONSTRUCTION AND DEVELOPMENT PLANNING COMMISSION FOR ALASKA, WEEKLY REPORT, MAY 8, 1964.

2. HOUSING AND HOME FINANCE AGENCY, LETTER TO THE FEDERAL RECONSTRUCTION AND DEVELOPMENT PLANNING COMMISSION FOR ALASKA, JUNE 26, 1964.

3. DOES NOT INCLUDE DAMAGE TO ANCHORAGE PUBLIC SCHOOLS.

4. CONTAINS DAMAGE TO STATE BUILDINGS IN VARIOUS PARTS OF ALASKA.

reation of the Small Business Administration disaster loan program in 1953
roviding low interest money to individuals suffering home and business losses,
nd the passage of Public Law 875 permitting federal agencies to supply equip-
ent and undertake emergency repairs to public facilities, residents in the
tricken area have been well cared for. Following a severe disaster today
ndividuals expect and demand substantial help from the federal government;
nis is in direct contrast with the attitude of many homeless residents of the
?06 San Francisco earthquake who refused to accept aid from outsiders because
ney didn't want to be regarded as beggars.

ne U.S. government felt the situation in Alaska following the quake was par-
lcularly critical because of the area's economic dependence on its two
llitary bases (Fort Richardson and Elmendorf Air Force Base) as well as a
arge number of Federal government facilities. Washington, therefore, felt it
ad to provide unprecedented aid to help the area get back on its feet. Table 2
lsts the amount and uses of grants to restore public facilities damaged or
estroyed by the earthquake. In general, all public buildings and facilities
are covered by Public Law 875, with the Corps of Engineers doing the lion's
nare of this repair work.[1] As can be seen from the figures, there was exten-
lve damage to transportation facilities, although the $37.5 million from the
ureau of Public Roads covers substantial improvements and widening of the
ighways over their pre-quake status. The Urban Renewal figure represents the
ederal government's share of the work; the remaining portion (25 percent) was
aid by the local communities themselves.

s shown in Table 3 the Small Business Administration was largely responsible
or aiding the private sector. Because of the magnitude of the disaster and
ne vast rebuilding program it necessitated, SBA modified its policy by making
roader and more liberal loans than they had done following other disasters.
ne major changes will be discussed in the section of this paper related to
lA activity.

armers who suffered damage to their homes and property were able to obtain
ans through the Farmers Home Administration. The agricultural areas were
parently only mildly affected by the disaster since only 39 loans were made
italing $259,030.

ne final item in Table 3 refers to the forgiveness provisions applied to mort-
ges held by financial institutions on severely damaged homes. Soon after the
rthquake the Federal National Mortgage Association (FNMA) passed an unprece-
nted ruling forgiving indebtedness on outstanding mortgages which they held.
meowners suffering severe damage were permitted to pay $1,000 in order to
lieve them of all obligation; naturally they surrendered equity on the home

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The Bureau of Yards and Docks, now the Naval Facility Engineering Command,
s in charge of restoring the Naval facilities on Kodiak Island.

Table 2

SOURCES AND USES OF FUNDS FOR PUBLIC SECTOR

(SOUTH CENTRAL ALASKA)

SOURCE	USE	MILLIONS OF $ (APPROX.)
PRESIDENT'S DISASTER FUND (P.L. 875)	RESTORATION OF PUBLIC FACILITIES	58.0
CORPS OF ENGINEERS		50.1
BUREAU OF YARDS AND DOCKS		2.3
FEDERAL AVIATION AGENCY		0.8
OTHER AGENCIES		0.3
REIMBURSEMENT TO STATE AND LOCAL GOVERNMENTS		4.5
BUREAU OF PUBLIC ROADS	RESTORATION OF HIGHWAYS	37.5
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	URBAN RENEWAL PROJECTS IN ANCHORAGE AND OTHER COMMUNITIES	27.4
DEPARTMENT OF THE INTERIOR	RESTORATION OF ALASKA RAILROAD	27.0
BUREAU OF INDIAN AFFAIRS	REBUILDING OF INDIAN VILLAGES	0.4
BUREAU OF RECLAMATION	REPAIR OF FEDERAL HYDROELECTRIC DAM AND POWER PLANT AT EKLUTNA	3.0
FORD FOUNDATION	GRANTS TO EDUCATION	1.0
TOTAL		154.3

SOURCE: ESTIMATES FROM FEDERAL AGENCIES PROVIDING AID TO PUBLIC SECTOR (May 1966)

Table 3

SOURCES AND USES OF FUNDS FOR PRIVATE SECTOR

(SOUTH CENTRAL ALASKA)

SOURCE	USE	MILLIONS OF $ (APPROX.)
SMALL BUSINESS ADMINISTRATION	LOANS FOR REPAIR AND RECONSTRUCTION OF PUBLIC AND PRIVATE FACILITIES	82.2
BUREAU OF COMMERCIAL FISHERIES	LOANS FOR REPAIR AND REPLACEMENT OF FISHING VESSELS	1.0
RURAL ELECTRIFICATION ADMINISTRATION	LOANS FOR REPAIR OF COOPERATIVE ELECTRIC POWER	0.1
FARMERS HOME ADMINISTRATION	LOANS FOR REPAIR AND RECONSTRUCTION OF FARM DWELLINGS	0.3
FEDERAL NATIONAL MORTGAGE ASSOCIATION AND "1964 ALASKA OMNIBUS ACT (AMENDED)"	FORGIVENESS ON MORTGAGE AND OTHER INDEBTEDNESS	2.4
TOTAL		86.0

SOURCE: ESTIMATES FROM FEDERAL AGENCIES PROVIDING AID TO PRIVATE SECTOR (MAY 1966)

if it still existed.[1] This provision spurred Congress to amend the "Alaska
Omnibus Act,"[2] thus permitting victims holding mortgages with private insti-
tutions to pay $1,000 for retiring their outstanding debt (not to exceed
$30,000 per home). As a criterion for this forgiveness, damage to the property
had to be greater than 60% of its value. The state and federal government will
equally share the cost of reimbursing the financial institutions who held these
mortgages. The latest estimate by the state of Alaska on the total cost of
this forgiveness provision is $2 million.

The Bureau of Commercial Fisheries was extremely helpful in getting fishermen
back on their feet. During April 1964, the U.S. Senate passed two statutes
enabling this agency to make loans for repairing damaged vessels or purchasing
new ones. Fishermen were also permitted to borrow funds for chartering
vessels, so they would not miss the season's catch.

Changes in the Labor Force

Losses from the Disaster Itself. As was pointed out above, the labor force
will be affected by the number of fatalities and injured people in the disaster
area as well as by migration behavior following the catastrophe. Normally one
would expect property damage to exceed by far the loss of human lives after a
limited disaster, with perhaps the only exception to this rule being some form
of plague or bacteriological disease which would destroy human lives without
attacking property.[3]

In Alaska the total loss of lives was relatively light (115 people) compared to
the physical damage, although the small communities were hit fairly hard in
proportion to their population. Table 4 lists the number of fatalities and
those injured and hospitalized in each of the south central Alaskan communi-
ties. The Anchorage area with 83,000 inhabitants lost only 22 residents while
Valdez (pop. 555) had 32 fatalities.

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1. The FNMA took over the mortgages of 25 homeowners whose residences were
totally destroyed or irreparably damaged. Although the total value of the
debts incurred was $475,000, FNMA kept its expense down to $410,000 through its
receipts of the token $1,000 payments and some slight recovery on the property
which they took over.

2. PL 88-451 "Alaska Omnibus Act (Amended)" 88th Congress, August 19, 1964.

3. Evidence on the recovery following the Black Plague, an example of this
type of disaster, is available in a study by Jack rshleifer, Disaster and
Recovery: The Black Death in W. Europe, RAND Memo 4700-TAB, February 1966.

Table 4

EFFECTS OF GOOD FRIDAY EARTHQUAKE ON POPULATION

IN SOUTH CENTRAL ALASKAN COMMUNITIES

AREA	POPULATION (1960)	KILLED	INJURED	HOSPITALIZED
ANCHORAGE	83,000	22	212	29
CORDOVA	1,800	28	9	1
KODIAK	7,200	19	74	5
SEWARD	3,000	14	126	50
VALDEZ	555	32	87	7
TOTAL	95,555	115	508	92

SOURCES: AMERICAN RED CROSS
           DEPARTMENT OF COMMERCE

Migration Patterns. Even if there were a large number of fatalities and
erious injuries in the disaster area, the size of the labor force would not
e affected if enough net in-migration of qualified workers occurred to offset
he decline due to the disaster.

mpirical evidence based on a number of domestic and foreign disasters
ndicates that out-migration from the area is generally of a short-run or
emporary nature.[1] Residents only leave their homes voluntarily if strong
arnings indicate a serious impending catastrophe; others may be forced to
vacuate after the disaster but they attempt to remain as close to their old
omes as possible, generally residing with friends or neighbors until they can
epair the damage or find a new place in which to live.

. large number of outsiders moving into the area are just interested in "sight-
eeing" and therefore plan to remain for only a few hours or days. The more
ermanent in-migrants are construction workers, many of whom have been unem-
loyed before the disaster. These men travel to the disaster zone in order to

. Marks, Eli S., Human Reactions in Disaster Situations, Univ. of Chicago,
une 1954. Fred C. Ikle and Others, Withdrawal Behavior in Disasters: Escape,
light, and Evacuation Movements, Washington, D.C., April 1957.

find employment with the intention of staying until their services are no
longer needed. Shortages of workers in the area normally do not occur; in
fact, there frequently is a surplus.

During the first few months following the Alaskan earthquake, there were quite
a few unemployed workers in the stricken area mainly because a large amount of
construction was delayed until geological tests were made, SBA loans approved,
and building permits issued. Despite an announcement by Governor William A.
Egan of Alaska that the community had more than enough construction workers,[1]
a number of men trekked up north after they heard news of the disaster. Many
of these travelers seeking employment in Anchorage had done construction work
during previous summers and decided to return earlier than usual;[2] others who
were unemployed in the continental United States hoped to find a job in Alaska.

Priority on openings was given to permanent residents so it was not surprising
to read in the Anchorage Market Newsletter of April 1964, that the in-migrants
comprised the bulk of the 2,340 job-seekers in the area and accounted for the
relatively high 7.7% unemployment rate in Anchorage. By the middle of the
summer when construction was in full swing, the unemployment rate had dropped
below 3%. Contractors indicated that the initial labor surplus appeared to
discourage others from coming to Alaska and caused a temporary shortage of
workers during July and August.

Speed of Recovery

Theoretical Concepts. One way of analyzing the speed of recovery following a
disaster is to construct equal-production possibility curves on a diagram as
shown in Figure 1. The curve Q_1 represents the production capability of the
area before the disaster, with Point A indicating the appropriate values for
labor (L) and capital (K). Point B depicts the region's economic status
immediately after the disaster, based on estimates of damage to physical and
human resources.

The amount of aid supplied from outside sources over time and changes in the
labor force through migration activity will be important factors in determining

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1. In making this discouraging statement Governor Egan was aware that there
would be a need for outsiders several months later when erection of new
buildings would begin in earnest. During the interim period, however, there
would even be an excess of local construction workers, so that in-migration
would just compound the unemployment problem.

2. During normal times summer employees arrive toward the end of May and
beginning of June for the start of the construction season.
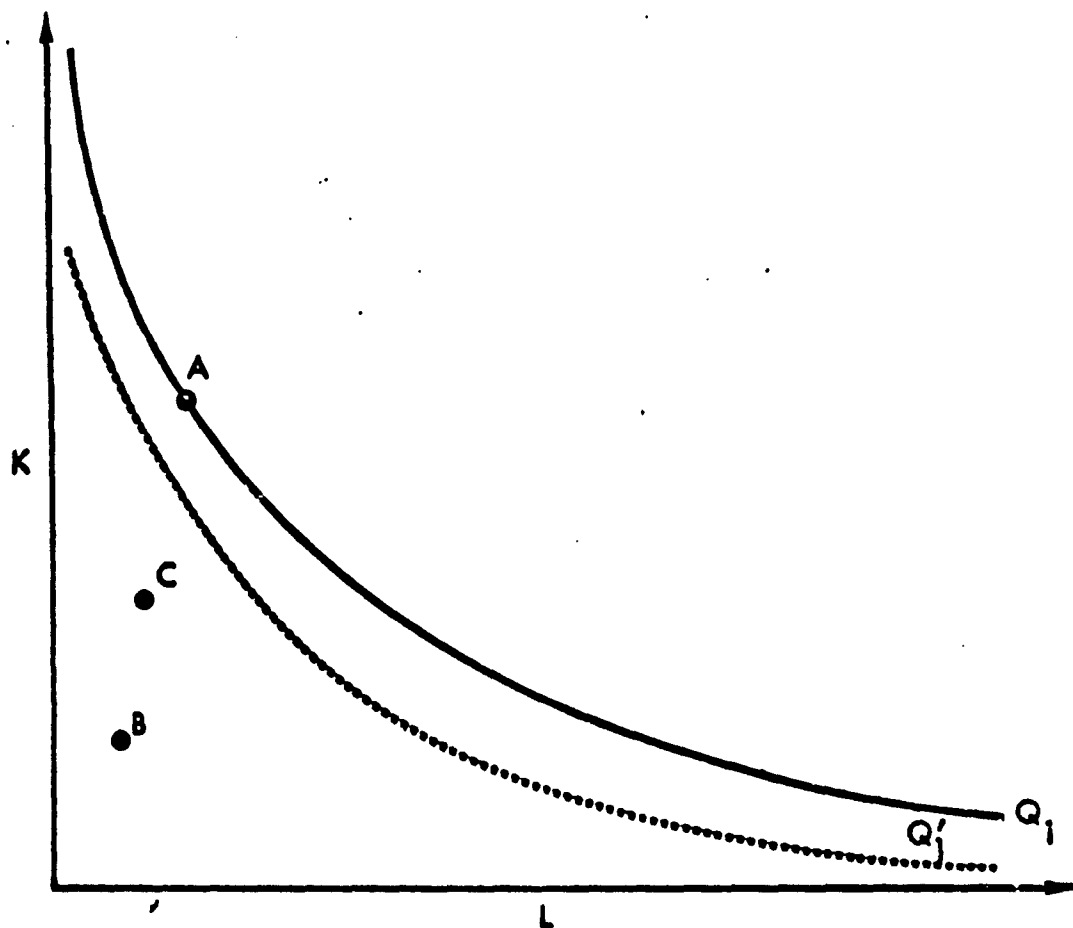
A = PRE-DISASTER STATUS

B = POST-DISASTER STATUS (ESTIMATED VALUES)

C = POST-DISASTER STATUS (ACTUAL VALUES)

EQUAL-OUTPUT CONTOURS BEFORE (Q_1) AND AFTER (Q_1') A DISASTER

Figure 1

the speed of recovery to the pre-disaster level. It is highly probable that
the stricken community will capitalize on its losses by taking advantage of
technological change and recent innovations, thus using capital and labor in a
more efficient way than when the damaged structures were originally built.
This more likely possibility is illustrated by curve Q_1' which yields the same
production capability as Q_1 but will always lie below it. In other words, for
any point on Q_1 there is a point on Q_1' which can be reached faster. Recovery
to the pre-disaster level may thus be more rapid than might have been expected
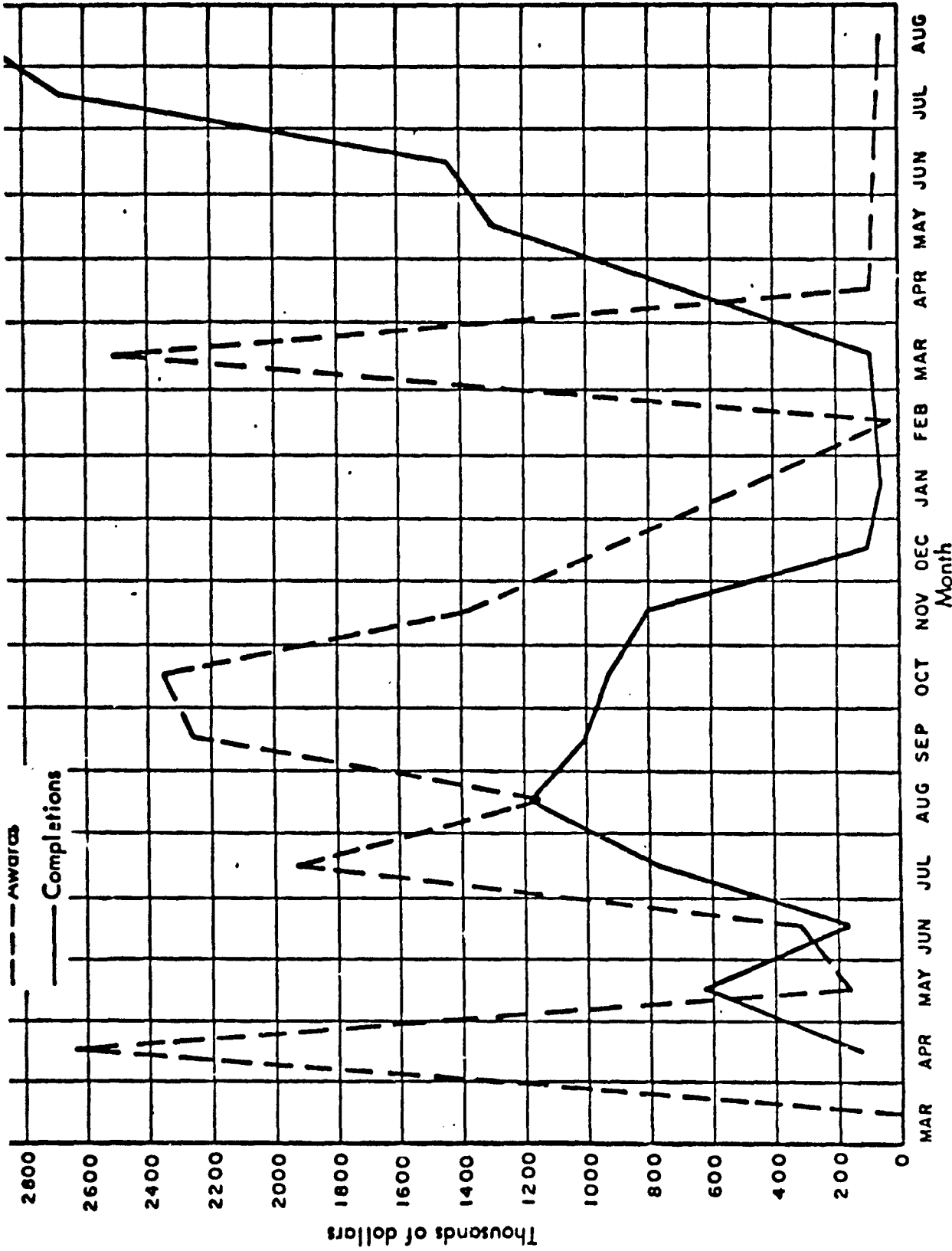from past behavior.

Another reason why recovery from a disaster appears to be unusually rapid is
the overestimation of damage to the area. If people read that physical losses
are in the order of $700 million and, in actual fact, damage is as low as
$150 million, it is not surprising to find that the community is back on its
feet faster than one would expect. Point C in Figure 1 indicates that actual
losses may be considerably less than the estimated figures, thus narrowing the
gap between pre- and immediate post-disaster capability.

Progress in Anchorage. The above concepts can be better understood by looking
at the time pattern of rebuilding public facilities in Anchorage after the
Good Friday earthquake. We have singled out this segment of the economy since
figures were available from the Corps of Engineers who supervised all public
construction for the city.[1]

Figure 2 compares the total value of public contracts awarded in Anchorage with
the work completed during each month following the quake. Aside from the
emergency repair contracts assigned immediately in April, there was a delay of
several months before other awards were made,[2] since restoration work was
dependent on the results of soil studies showing where it would be safe to
relocate structures. Reconstruction during the initial post-disaster period
was thus confined to the repair of utilities such as water, sewer, electricity,
and telephones. These facilities were restored to a level of operation which
would eliminate any possible health hazard (e.g., contamination of the water
supply by broken sewers). At the same time the Corps was involved in demolition
work which consisted of debris clearance and the razing of irreparable struc-
tures. Except for a few small projects in the final planning stages scheduled
for completion this spring, all construction work was wrapped up by the end of
the fall of 1965, less than one and one-half years after the earthquake. Theo-
retically, reconstruction might have been more rapid than it actually was had

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1. Data on the private sector can only be obtained from building permit valu-
ations which provide a gross approximation to actual expenditures. We have
thus concentrated our analysis solely on the more accurate figures for public
construction.

2. During May and June 1964, the only construction contract was the restora-
tion of telephone lines ($63,013); the remaining awards were for debris clear-
ance and architectural studies.

Value of Earthquake Restoration to Public Facilities in Anchorage (March, 1964 – August, 1965)

Source: Corps of Engineers (Alaska District Contractual Progress Reports)

Figure 2

the Corps not intentionally delayed awarding non-priority contracts during the 1964 season to ease the pressure on the limited labor force and thus minimize the possibilities of inflation.

Overestimation of Damage. One of the most interesting observations to be made on the reconstruction of public facilities after the quake is the huge discrepancy between damage estimates and actual losses. These data are presented in Table 5 for Anchorage state and local facilities. The loss estimates appearing in the first column, were not hastily arrived at but were made almost three months after the quake. The amount of funds eligible under Public Law 875, refers to federal government aid for debris clearance, the restoration of public utilities, and the repair of docks and other community facilities. The data on actual construction are comparable with the first two columns since by May 1966, all projects related to state and local facilities in Anchorage either had been completed or were in the final stages of construction.[1]

It is hard to find any specific reason why damage estimates differed so radically from actual construction needs. There obviously was no financial reason for partially restoring facilities since the money actually spent was far below the authorized amounts allowed under PL-875. In fact, the provisions of this legislation were interpreted rather broadly because of the severity of the Anchorage quake. Rather than simply authorizing funds for temporary restoration of public facilities (as was the intent of PL-875), the OEP permitted permanent repair and even some modernization of damaged buildings and utilities.

Perhaps the best explanation, although not a very satisfactory one, can be found in the uncertainty of making damage estimates before a great deal of work has been done. In such cases, political factors favor overestimation of costs since it is much easier to return unused funds than to obtain more aid. Recovery may therefore appear unusually rapid simply because the estimates of necessary restoration work (Point B in Fig. 1) are far higher than the expenditures actually required (Point C in Fig. 1).

Influence of Technological Change. To illustrate the effects of technological change on the recovery pattern in Anchorage and the consequent shift of the production possibility curve from Q_1 to Q_1^T (as shown in Fig. 1), we can observe the positive change it appeared to induce in construction. Prior to 1964 building activity was limited to only five or six months, beginning sometime in April and tapering off by October. In order to complete as much work as possible, contractors often had their employees undertake substantial amounts of overtime during the summer months, thereby increasing overall costs and

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1. The only public construction in Anchorage not included in our figures are some urban renewal projects being undertaken by the Corps. This work had nothing to do with state and local facilities but was related to new housing developments.

Table 5

COMPARISON OF DAMAGE ESTIMATES, PL-875 ELIGIBILITY FUNDS AND ACTUAL
EXPENDITURES RELATING TO ANCHORAGE STATE AND LOCAL FACILITIES
(MILLIONS OF $)

ITEM	DAMAGE[a] ESTIMATE	AMOUNT[a] ELIGIBLE (PL-875)	ACTUAL EXPENDITURES[b]
PUBLIC UTILITIES (WATER, SEWER, ELECTRIC, TELEPHONE)	30.5	20.0	7.1
PUBLIC BUILDINGS	0.8	0.8	0.6
HEALTH FACILITIES	0.2	0.2	0.2
TRANSPORTATION FACILITIES	13.8	12.7	2.5
CORPS OF ENGINEERS WORK			(1.3)
INTERNATIONAL AIRPORT RESTORATION (FAA)			(1.2)
EDUCATIONAL FACILITIES	10.0	10.0	5.7
DEBRIS CLEARANCE	2.0	1.8	0.8
ENGINEERING SERVICES	-	1.6	2.6
TOTAL	57.3	47.1	19.5

[a]SOURCE: OFFICE OF EMERGENCY PLANNING, JUNE 19, 1964.

[b]SOURCE: OFFICE OF EMERGENCY PLANNING, May 1966
                   FEDERAL AVIATION AGENCY.

lowering workers' efficiency because of the long hours. The winter construction was normally restricted to structures which had been closed-in by the end of fall and therefore could be adequately heated. The need for workers was thus restricted to the specialized trades (e.g., electricians and plumbers); common laborers either departed for the continental U.S. or remained unemployed during the winter months.

Because of the required soil studies following the quake there was a substantial delay in reconstruction contract awards, so it was not until July that most jobs were actually underway. The need to repair or restore facilities (e.g., schools) as rapidly as possible forced contractors to adopt new methods for continuing work on buildings which were not closed in by the end of October. By draping a plastic covering, such as Visqueen, over the partially completed structure, portable heaters were effective in warming up the work area. Consequently substantial construction was undertaken during the winter months. Although plastic coverings had been on the market for several years, they had not been used in Alaska in the past; the crisis situation encouraged the contractors to take advantage of this new method for increasing productivity during periods of cold weather.

To illustrate the change in the winter building pattern caused by the quake, the total number of hours worked per quarter in contract construction for the Anchorage area has been computed. Table 6 presents these figures for the years 1962 to 1964, as well as the quarterly hours worked as a percentage of the peak period. The number of construction hours worked during the fourth quarter of 1964, as well as the percentage of the peak-period hours worked during that quarter, increased significantly beyond the figures for the previous two years.

Due to the effectiveness of the plastic covering, contractors now feel it is to their advantage to continue this expansion of winter construction in the future. Since productivity per worker increased during the cold weather, they would prefer to have a more stable labor force working regular hours throughout the year than to rely quite as much on substantial blocks of overtime from their summer crew, who also tend to spend most of their earner money in the "lower 48" rather than in Alaska.[1]

Federal Disaster Activities in the Private Sector

In the last section we observed that the speed of long-term economic recovery after natural disasters depends not only on the severity of damage to human and

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1. The building pattern for 1965 should be more indicative of whether the post-quake winter construction season was a basic change or simply a temporary measure to meet an emergency situation. We shall shortly have the data necessary to compute these appropriate percentages.

Table 6

ANCHORAGE CONTRACT CONSTRUCTION HOURS (PER QUARTER) AND ITS PERCENTAGE OF THE PEAK PERIOD (1962-1964)

1ST QUARTER	HOURS	9,687	7,258	9,719
	% OF PEAK PERIOD	.27	.21	.23
2ND QUARTER	HOURS	19,625	16,585	23,909
	% OF PEAK PERIOD	.55	.47	.57
3RD QUARTER	HOURS	35,587	35,234	42,334
	% OF PEAK PERIOD	1	1	1
4TH QUARTER	HOURS	19,139	19,094	33,102
	% OF PEAK PERIOD	.54	.54	.78

physical resources but also on the amount of outside aid forthcoming. An exaggeration of damage estimates as well as the adoption of new innovations in reconstruction activity often leads to a faster recovery than may have been expected on the basis of information from newspapers or other reports. To illustrate the pattern of recovery we utilized data primarily on the public sector in Anchorage. This section will be devoted to the role of the federal government in the private sector via the Small Business Administration. By illustrating the policies pursued following a natural disaster, it should become clearer why it is so necessary to develop a system of disaster insurance to cover losses to both homes and businesses.

Purpose of SBA Disaster Loans

The general purpose of SBA disaster loans is "to restore a victim's home or business property as nearly as possible to its pre-disaster condition."[1] Before the Alaskan earthquake the agency provided 3% loans with a maximum repayment period of 20 years to cover the exact amount of physical damage. It was understood that the borrower would use the entire loan strictly for the purpose of rebuilding or repair. The severity of the damage in Alaska caused concern that, unless the SBA liberalized its loan policy, many individuals would not be able to pay off their old mortgages and other debts. Considerable losses might result not only for local banks but also for many out-of-state financial institutions, such as the Bowery Savings Bank in N.Y., which owned many mortgages in Anchorage. The Alaskan politicians were keenly aware of the negative effect that these declarations of bankruptcy would have on the future credit and rebuilding of Alaska. Pressure from them produced several changes in SBA disaster loan policy for Alaska. Perhaps the most significant revision was the authorization of loans for substantial debt retirement for any home-owner or businessman suffering losses from the quake. He was given funds not only to repair his damaged structure but also to retire old debts (e.g., outstanding mortgage, accounts payable) which may have had nothing to do with the disaster itself. Thus, instead of continuing to pay conventional six or eight percent rates on these outstanding claims, the borrower could now retire them at a subsidized 3% rate. A further reduction in the size of the victim's monthly payment was achieved by permitting a 30 year amortization period instead of the normal 20 year maturity of SBA loans. If the property owner requested it, the agency would waive any payment on principal and interest during the first year of the loan and on principal up to an additional four years. Thus the victim's burden was minimized; in fact, in a number of cases, particularly for businesses, the borrower was financially sounder after the disaster than before.

Although the SBA made it very clear that its actions in Alaska were taken to meet a special situation, there is clear evidence that the agency has not

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1. "SBA Disaster Loans" Small Business Administration, October 1964, p. 2.

retreated back to its more stringent policy. Using the Alaskan case as a prec-
edent, a Congressional bill was passed in August 1965, authorizing the SBA to
extend permanently its maximum loan period from 20 to 30 years.[1] The Hurricane
Betsy Disaster Relief Act authorized the Small Business Administration to
"forgive" a part of each loan up to a maximum of $1,800,[2] a provision which was
not even permitted in Alaska.

Uses of SBA Loans in Alaska

In order to analyze the purposes of SBA loans in Alaska, a large random sample
of actual cases was studied. The sample consisting of every third disaster
loan folder on file in the Anchorage SBA office,[3] yielded information on the
fraction of each loan allocated for debt retirement, repairs, and new con-
struction. The last category includes not only funds for replacement of per-
sonal property and capital equipment but also working capital loans.

Sample data on home loans are given in Table 7 for Anchorage and other areas.
Since the largest damage occurred in a section of town with relatively new and
expensive dwellings,[2] displaced residents were heavily mortgaged and, there-
fore, made far greater use of SBA loans for debt retirement than elsewhere.
At the same time many of these families postponed applying for SBA funds to
build a new house until they knew whether their area had been declared geo-
logically sound. These two factors largely explain why the proportional allo
cation of funds for new construction in Anchorage was lower than in the out-
lying regions.

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1. _Small Business Act_ PL 89-59, 89th Congress First Session, August 30, 1965.

2. The actual provision requires that the borrower pay the first $500 of the
loan, will then receive forgiveness of the entire amount of the loan between
$500 and $1,500 and half of the loan amount above $1,500 up to a maximum for-
giveness of $1,800. Applying this tripartite formula one finds that for any
loan greater than or equal to $3,100, the borrower receives the maximum grant
of $1,800.

3. We would like to express our appreciation to Miss Judith Pepper of the SBA
who compiled these sample data for us. These folders applied only to SBA ap-
proved loans; however, approximately 18 percent were missing from the Anchorage
files. Since we do not know the characteristics of the missing folders, we are
not certain that the sample is representative of SBA loans.

4. Most of the damaged homes in this area overlooked the Turnagain bluff and
therefore slid down the hill when the earth gave way.

Table 7

NUMBER AND VALUE OF SBA HOME LOANS (TOTAL SAMPLE)[a]

| | | | Distribution of Loan, thousands of $ | | |
Year and Quarter	Number	Value, Thousands of $	Debt Retirement	New Construction	Repair
Anchorage					
1964, 2nd	48	1020	372	323	325
1964, 3rd	61	1055	379	251	425
1964, 4th	26	508	176	219	113
1965, 1st	10	454	265	57	132
Totals	145	3037	1192	850	995
Other Areas					
1964, 2nd	23	205	11	166	28
1964, 3rd	12	135	24	81	30
1964, 4th	7	112	32	29	51
1965, 1st	1	1	0	1	0
Totals	43	453	67	277	109

a. Source: Small Business Administration

A similar pattern is evident for business loans as shown in Table 8. Anchorage firms used a smaller proportion of their SBA loans for new construction than did businesses in other regions mainly because they took the earthquake as an occasion for refinancing their sizable debts at the more favorable interest rates offered by the federal government.

It is also possible that some Anchorage businesses had over-expanded prior to the earthquake and consequently used SBA funds for rebuilding facilities to less than their pre-disaster levels. It is difficult to confirm this hypothesis statistically, but some close observers of Alaska business trends have stated that extreme optimism at the time of statehood undoubtedly engendered some excess construction by firms in Anchorage and that the disaster helped to rectify past mistakes.

Equity of SBA Loans in Alaska

A major criticism of the present system of disaster relief is that the gambler is frequently rewarded while the individual practicing the social virtues often comes out on the short end.

Mortgage vs. Cash Payment. This assertion can be better understood by considering the hypothetical case of two neighbors A and B both of whom suffered $10,000 worth of damage to their brand new identical homes. The only difference between the homeowners is that A purchased his dwelling with cash while B made a downpayment of $5,000 and took out a conventional 6.5% mortgage[1] for the remaining $30,000. Table 9 (Case 1) represents the pre-disaster position of both individuals. Under the assumption that before the purchase of the home A and B each had $35,000 in their savings account, we now find that A has a zero balance while B has $30,000 but an obligation for an equal amount. Both neighbors thus have identical net worths in present value terms.

The SBA disaster policy in Alaska following the quake would have tipped the scales in favor of individual B, as can be seen by looking at Case 2 in Table 9. He could have obtained a 3% loan to cover not only his losses but also the outstanding $30,000 mortgage. Neighbor A, on the other hand, who preferred to own the house outright could only have received a loan for $10,000 to handle repairs. Although his monthly payments would be one-fourth those of B, his net worth would have been almost $10,000 less and somewhat below his own pre-quake position. It is understandable that A might be irritated by observing that his neighbor had been able to increase the total value of his net worth, despite a $10,000 loss. Cynical but understandable comments are often heard today in

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[1]. A 6.5% interest rate has been chosen under the assumption that a person has 3/4 of his debt in a first mortgage at 6% and the other 1/4 in a second mortgage at 8%.

Table 8

NUMBER AND VALUE OF SBA BUSINESS LOANS (TOTAL SAMPLE)[a]

Year and Quarter	Number	Value, Thousands of $	Distribution of Loan, thousands of $		
			Debt Retirement	New Construction	Repair
Anchorage					
1964, 2nd	29	4619	1681	2571	367
1964, 3rd	24	1792	1134	337	321
1964, 4th	14	717	303	231	183
1965, 1st	6	432	260	140	32
Totals	73	7560	3378	3279	903
Other Areas					
1964, 2nd	49	1697	277	1307	113
1964, 3rd	19	3231	596	2599	36
1964, 4th	18	775	255	383	137
1965, 1st	3	90	13	77	---
Totals	89	5793	1141	4366	286

a. Source: Small Business Administration

TABLE 9

COMPARISON OF PRE- AND POST-DISASTER PAYMENTS AND EQUITY POSITION FOR HOMEOWNER WITH NEW RESIDENCE ($35,000) DAMAGED BY THE ALASKAN EARTHQUAKE

CASE 1: PRE-DISASTER

(1) INDIV.	(2) TYPE OF LOAN	(3) LENGTH OF LOAN (IN YRS)	(4) INTEREST RATE	(5) AMOUNT OF LOAN	(6) MONTHLY PAYMENTS	(7) PRESENT VALUE OF LOAN (DISCOUNTED AT 6.5%)	(8) VALUE OF PROPERTY	(9) SAVINGS ACCOUNT	(10) NET WORTH (8)+(9)-(7)
A	CASH	-	-	-	-	-	35,000	0	35,000
B	CONVEN-TIONAL	20	6.5%	30,000	223	30,000	35,000	30,000	35,000

CASE 2: POST-DISASTER

INDIVIDUAL A

LOSS - $10,000

LOAN - $10,000

REPAIRS - $10,000

INDIVIDUAL B

LOSS - $10,000

LOAN - $40,000

REPAIRS - $10,000

DEBT RETIREMENT - $30,000 (OLD MORTGAGE)

(1) INDIV.	(2) TYPE OF LOAN	(3) LENGTH OF LOAN (IN YRS)	(4) INTEREST RATE	(5) AMOUNT OF LOAN	(6) MONTHLY PAYMENTS	(7) PRESENT VALUE OF LOAN (DISCOUNTED AT 6.5%)	(8) VALUE OF PROPERTY	(9) SAVINGS ACCOUNT	(10) NET WORTH (8)+(9)-(7)
A	SBA	30	3%	10,000	42	6,671	35,000	0	28,329
B	SBA	30	3%	40,000	169	26,684	35,000	30,000	38,316

Alaska to the effect that "It's best to make the smallest downpayment and take out the largest possible mortgage so that you can cash in after the next earthquake."

Gambler vs. Insurer. Another disturbing case of the inequity created by SBA loan policy in Alaska relates to the person who took out earthquake insurance. The individual who prudently guarded against a severe loss with a small annual payment found that his net worth position after the quake was lower than a homeowner who had gambled by not buying a policy. To illustrate this point we shall bring individual C into the picture. For simplicity let us assume that his actions were identical with B except that, on taking out his $30,000 mortgage, he also purchased an earthquake insurance policy for $50 which covered him against all damages to his home. Table 10 (Case 1) depicts the pre-disaster position of both individuals. It indicates that the net worth position of the two individuals before the disaster differs by just $50, reflecting the insurance payment by C. Although C is reimbursed for his $10,000 earthquake loss by the insurance company so that his net worth remains unchanged, he is rather surprised to find that his neighbor B actually fares better by obtaining an SBA loan to cover his mortgage as well as his repairs, as shown in Table 10 (Case 2). Instead of B's net worth decreasing, as would be expected under normal circumstances, it actually increases because of the low interest rate. To make matters more unfair, B is able to gain even further by writing off his losses for tax purposes since his property was uninsured.

Businessman with Substantial Debts. Loans to businesses damaged by the quake offered the entrepreneur an opportunity to retire his conventional loans at rather unconventional rates. As an example I will cite the actual case of an Anchorage mobile trailer camp whose land was shifted by the quake causing damage to some vehicles and forcing the relocation of the others. At the time of the quake the firm had $60,000 in debts outstanding as Column (5) in Table 11 (Case 1) indicates. Two alternative possibilities have been depicted in this portion of the table--an original 10-year loan of $60,000 at 6.5% made just before the quake or a larger 10-year loan of $100,000 at 6.5% made a few years before the disaster. Under the assumption that the company had assets of $100,000, the present value of its net worth in both instances is $40,000.

Following the quake the SBA came to the rescue by offering a loan for $75,000, 80% of which was used to retire old debts, as shown in Table 11 (Case 2). Although in this particular case the applicant was given a 30-year loan with monthly payments totalling less than half of what they were before the quake,[1]

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1. Commercial banks felt that it was highly unlikely for any small business in Alaska to obtain a loan for more than 10 years so this time period was chosen as an upper limit. Assuming a 10-year loan for $60,000 at a 6.5% pre-disaster rate, monthly payments would have been $680 compared to the $315 monthly charge following the quake (see Table 11). Obviously with a larger original loan (e.g., $100,000) and shorter-term repayment period (e.g., 7 years) the pre- and post-quake differentials would have been even greater.

Table 10

Comparison of Pre and Post-Disaster Payments and Equity Position
for Insured and Non-Insured Homeowners with New Residence
($35,000) Damaged by the Quake

CASE 1: PRE-DISASTER

(1) INDIV.	(2) TYPE OF LOAN	(3) LENGTH OF LOAN (IN YRS)	(4) INTEREST RATE	(5) AMOUNT OF LOAN	(6) MONTHLY PAYMENTS	(7) PRESENT VALUE OF LOAN (DISCOUNTED AT 6.5%)	(8) VALUE OF PROPERTY	(9) INSURANCE PREMIUM	(10) SAVINGS ACCOUNT	(11) NET WORTH (8)+(10)-(7)
B	CONVENTIONAL	20	6.5%	30,000	223	30,000	35,000		30,000	35,000
C	CONVENTIONAL	20	6.5%	30,000	223	30,000	35,000	50	29,950	34,950

CASE 2: POST-DISASTER

INDIVIDUAL B

LOSS - $10,000

LOAN - $40,000

REPAIRS - $10,000

DEBT RETIREMENT - $30,000 (OLD MORTGAGE)

INDIVIDUAL C

LOSS - $10,000

INSURANCE PAYMENT - $10,000

(1) INDIV.	(2) TYPE OF LOAN	(3) LENGTH OF LOAN (IN YRS)	(4) INTEREST RATE	(5) AMOUNT OF LOAN	(6) MONTHLY PAYMENTS	(7) PRESENT VALUE OF LOAN (DISCOUNTED AT 6.5%)	(8) VALUE OF PROPERTY	(9) INSURANCE PREMIUM	(10) SAVINGS ACCOUNT	(11) NET WORTH (8)+(10)-(7)
B	SBA	30	3%	40,000	169	26,684	35,000		30,000	38,316
C	CONVENTIONAL	20	6.5%	30,000	223	30,000	35,000	50	29,950	34,950

Table 11

COMPARISON OF PRE- AND POST-QUAKE PAYMENTS AND EQUITY POSITION FOR BUSINESS SUFFERING DAMAGE FROM ALASKAN EARTHQUAKE

CASE 1: PRE-DISASTER

(1) TYPE OF LOAN	(2) LENGTH OF LOAN (IN YRS)	(3) INTEREST RATE	(4) AMOUNT OF ORIGINAL LOAN	(5) AMOUNT OF LOAN OUTSTANDING	(6) MONTHLY PAYMENTS	(7) DISCOUNT VALUE OF OUTSTANDING LOAN (DISCOUNTED AT 6.5%)	(8) ASSETS	(9) NET WORTH (8) – (7)
CONVENTIONAL	10	6.5%	60,000	60,000	690	60,000	100,000	40,000
CONVENTIONAL	10	6.5%	100,000	60,000	1,133	60,000	100,000	40,000

CASE 2: POST-DISASTER

LOSS – $13,860

SBA LOAN – $75,000

REPAIRS – $13,860

RELOCATION EXPENSES – $1,140

DEBT RETIREMENT – $60,000

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SBA	20	3 %	75,000	75,000	416	55,870	100,000	44,130
SBA	30	3 %	75,000	75,000	315	50,032	100,000	49,968

we have also included the payment schedule and effect on net worth of a 20-year
SBA loan. In both cases the firm's networth has increased over its pre-quake
value despite the $15,000 in damages to the property. It is now easier to
understand why so many local businessmen and uninsured homeowners with sizable
mortgages felt that the earthquake was "the best thing that ever happened to
Anchorage."

The Need for Disaster Insurance

Following each new catastrophe in the last couple of years, some form of special
congressional legislation has been passed providing more liberal relief to the
victims than was offered in the past. As we have seen, there may be so much
federal aid poured into an area following a disaster that many individuals
suffering damage are better off than before the calamity. This generosity by
the federal government does nothing to discourage individuals from living or
moving into certain regions (e.g., flood plains), thereby perpetuating the need
for more loans and grants in the future. One way of alleviating these problems
is to develop a system of disaster insurance which will provide protection in a
more equitable fashion than does the current system of relief. This section
analyzes the problems involved in developing some comprehensive insurance
scheme.

Current Disaster Insurance Policies.

Fire. Since the word "disaster" commonly refers to an event affecting a large
group of people, fires are normally not classified under this heading unless a
number of homes or businesses are damaged. It is precisely because blazes are
generally localized that insurance companies are more than willing to issue
policies, for the danger of a holocaust in any one area is small so that the
premiums of many individuals pay for the losses of a few.

It makes little sense for an individual _not_ to carry fire insurance on his
house since it would be a disaster if he were liable for all losses. There-
fore, practically every homeowner in the country pays the small premium for
fire insurance although he will probably never actually collect on the policy.

Tornadoes. When tornadoes actually hit a community, they normally produce
serious destruction as evidenced by the series of twisters which affected the
mid-West during the spring of 1965. Windstorms can affect any area of the
country,[1] so therefore interest in some form of protection is nationwide. Since
the damage from wind is normally limited to a small area, companies have been
willing to include this type of disaster as part of the extended coverage policy
which generally accompanies fire insurance.

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1. During 1957, for example, the only three states not hit by tornadoes were
Maryland, Nevada and Rhode Island.

Earthquakes. Insurance companies are in an awkward position when it comes to
issuing earthquake policies. Since there have been few serious earthquakes in
parts of the world where dwellings are constructed with materials similar to
those used in the United States, it has been difficult to determine an accurate
basis for premiums except through geologists' theoretical reports. Nevertheless,
it is generally accepted by companies that wood frame houses will stand up well
even under the strongest shocks. This was certainly the case in Anchorage,
where most of the homes were of this type construction and serious losses to
these dwellings were primarily caused by the earth slides in the Turnagain area.

Table 12 details the premiums for different structures in Alaska as specified
by the Pacific Fire Rating Bureau. Despite these low rates on wood frame
dwellings, very few homeowners in Alaska actually carried policies. A compari-
son of the amount of fire and earthquake insurance premiums written in the
state during each of the last six years is presented in Table 13. The rise in
1964 earthquake policies over the previous year is mainly due to the SBA's
requirement that insurance be taken out when using the 3% loan on homes in
high-risk areas. According to Anchorage insurance firms, a large voluntary
demand for coverage on the part of the general public did not occur; most
residents felt that another serious quake would not take place in their life-
time and if it did, the government would again come to the rescue. At the same
time companies have not encouraged residents to buy insurance policies protecting
them against damage from a quake, since a single firm stands to lose a substan-
tial sum of money if it has insured a large number of houses in one region and
they are all destroyed. Therefore, concerns are only willing to hold a limited
block of insurance in any one region so the risk of a single large loss is
minimized. If too many residents request coverage from them, they will simply
have to reinsure with another company.

The obvious solution from the point of view of a single company would be to
increase existing rates so as to protect against a potential high loss from an
earthquake occurring tomorrow rather than twenty years from now. At present,
firms prefer to look at this type of insurance as a special service for
customers holding other policies with them rather than as a profitmaking
business; they accept the premiums set by the Fire Rating Bureau primarily
because few people take out policies.

Floods and Hurricanes. It is impossible for property owners to buy insurance
against floods or water damage from other storms even if they are willing to
pay a high premium. Protection is available only on movable or personal
property such as jewelry and furs (covered by a floater policy),[1] motor vehicles
(covered by comprehensive insurance), or boats, shipping equipment and cargo in
transit (covered by marine insurance).[2]

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1. A floater policy insurance against damage to the object regardless of change
in location.
2. Tunnels and bridges are the only non-movable objects where it is possible
to buy insurance against water damage (under an all-risk policy).

Table 12

EARTHQUAKE INSURANCE RATES IN ALASKA[a]

CONSTRUCTION[b]	MANDATORY[c] DEDUCTION, PERCENT	RATE PER $1000 OF INSURANCE, $			
		1-4 FAMILY		5-20 FAMILY	
		BUILDING	CONTENTS	BUILDING	CONTENTS
FRAME HOUSES (THREE STORIES OR LESS IN HEIGHT)	5	1.10	1.10	1.10	1.10
FRAME HOUSES (OVER THREE STORIES IN HEIGHT)	5	1.10	1.10	2.30	1.10
ALL OR PART OF BRICK, STONE OR CONCRETE (NOT CONCRETE BLOCK)	10	5.30	4.20	5.00	4.20
ALL OR PART MASONRY- BUILDING VENEER CONTENTS	15 / 5	17.50	1.10	16.60	1.10
ALL OR PART CONCRETE BLOCK, TILE, ADOBE, OR METAL	15	17.50	17.50	16.60	17.50

[a]SOURCE: PACIFIC FIRE RATING BUREAU (JULY 1964).

[b]IF BUILDING IS ON FILLED GROUND (NOT FIRM NATURAL GROUND), INCREASE ALL EARTHQUAKE RATES 25 PERCENT.

[c]DEDUCTIBLE PERCENT APPLIES TO ACTUAL CASH VALUE OF THE PROPERTY INSURED (NOT AMOUNT OF INSURANCE).

Table 13

VALUE OF FIRE AND EARTHQUAKE INSURANCE PREMIUMS
WRITTEN IN ALASKA

YEAR	FIRE INSURANCE	EARTHQUAKE INSURANCE
1959	$5,302,343	$17,731
1960	5,719,705	11,637
1961	5,352,916	7,505
1962	5,528,924	20,623
1963	5,026,287	4,811
1964	NOT AVAILABLE	22,659

SOURCE: ALASKA INSURANCE REPORTS (1959-1964)

A number of studies have been undertaken in recent years on the feasibility of some form of flood insurance.[1] In a staff report for the Senate Banking and Currency Committee in 1956, the following conclusion was reached:

> "Because of the virtual certainty of the loss and its catastrophic nature and the impossibility of making this line of insurance self-supporting due to refusal of the public to purchase such insurance at the rates which would have to be charged to pay annual losses, companies generally could not prudently engage in this field of underwriting."[2]

Following the disastrous floods which affected the mid-West in 1952, the factory mutual insurance companies sent questionnaires to 25,000 of their fire insurance policyholders in the country. Only 10% of those who responded were interested in any form of flood insurance and then only if the rates were low. Since only those property owners who had a flood hazard would insure their risks, the premiums to be charged would necessarily have to be high and, therefore, corporations would rather take their losses as a deduction from their Federal income taxes.[3] By self-insuring the companies would be able to make money in the long-run since almost 40% of insurance premiums cover administration costs.

Homeowners might be more willing to take out policies even at a high premium since their tax write-offs would undoubtedly be less than a corporation's and a large part of their equity is tied up in their own dwelling unit.[4] However, insurance concerns are hesitant in offering flood protection even at high rates unless their competitors follow suit. According to the 1956 Senate report, "the entire industry apparently agreed with the conclusion that flood insurance did not provide an attractive commercial venture for profit making purposes."[5]

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1. See, for example, two reports by the American Insurance Association, Studies of Floods and Flood Damage (1952-19__) and Studies of Floods and Flood Damage (1962) report).

2. U.S. Senate Committee on Banking and Currency, Federal Disaster Insurance, (Washington: Government Printing Office, 1956), p. 238.

3. Ibid., p. 241.

4. On the other hand, insurance premiums for private individuals are not deductible from taxes as they are for a corporation. This factor would be a disincentive to buy flood insurance.

5. Ibid., p. 241.

Summary

This study of protection currently offered by insurance companies against various natural disasters has shown the following policies to be widespread:

- If there is a small risk of serious and large-scale damage to any area, then companies encourage individuals to take out insurance policies, i.e., fire.

- If a disaster can potentially affect any part of the country, i.e., tornadoes, then insurance firms can actually justify coverage since the relatively low premiums of many will pay for the damage of a few.

- Insurance companies are concerned with their public image and will therefore insure against earthquakes at low rates. Since damage to most homes is small, companies are not in danger of suffering overwhelming losses.

- In the case of floods, companies are opposed to insurance because of the relative certainty of the event in particular regions and the knowledge that only individuals in those areas would be interested in a policy, thereby necessitating unusually high rates.

Framework for Comprehensive Disaster Insurance System

If experience has proved that a natural disaster can strike any area of the country, insurance companies will include protection against these losses under the standardized extended coverage clause. Catastrophes which are considered to be regional will either be covered by a separate policy (i.e., earthquakes)[1] or not insured at all (i.e., floods and water damage from hurricanes).

The federal government has preferred to stay out of the insurance field unless the industry has not been in a position to handle particular types of policies. This section will consider the basic framework necessary for developing a comprehensive system of _private_ insurance where all natural disasters are combined into a single package policy. Our concern will not only be on the economic benefits resulting from such a plan but also on its feasibility.

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[1]. Although seismologists claim that no area of the country is immune from earthquakes, only the western part of the country has suffered any damage during the last 100 years. Insurance companies, therefore, look at shocks as a regional rather than national problem.

Nature of Premiums

It is much easier to talk theoretically about a basis for insurance premiums
than actually to calculate the rates. Suppose, for example, that a man wants
to insure his $50,000 house against fire damage. If the insurance company had
determined that the expected annual loss on a home of his type construction
and value was $50, then the rate per $1,000 would be $1 plus a certain fraction
for company overhead and profit.

If this concept of premiums based on degree of risk were utilized in developing
a system of comprehensive disaster insurance, the suggested program should be
clear. Individuals in disaster-prone regions would pay the price for living
there; fees should be higher in areas most likely to receive severe damage from
natural disasters.[1] This principle of differential premiums is in direct con-
trast with the government's recent attitude toward disasters in the United
States. Once a stricken community or region is classified as a "disaster area"
large amounts of federal grants and loans are made for rehabilitation. It is
true that south central Alaska was an extreme case because of its dependence
on federal funds in normal times; however, aid to flood and hurricane victims
suffering damage during 1965 was generous although somewhat more selective than
in Alaska.

The problem of actually calculating premiums may be particularly difficult. For
example, in attempting to develop realistic rates against flood insurance it
would be necessary to differentiate between homes on a river bank and those
located 100 yards away from it.

Spreading the Risk

In order for firms to be interested in any disaster insurance plan, there must
be enough people from different parts of the country participating to diversify
the risks. In fact, the main reason for companies opposing any private form
of flood insurance was that only those subject to the high risk of damage would
voluntarily take out policies.

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1. Even today the requirements on home mortgages reflect the risk of living
in a particular area and the absence of some forms of insurance coverage
(e.g., against water damage from hurricanes). Thus if a person wishes to buy
a home on the Middle Atlantic Coast he characteristically makes a downpayment
which reflects the proportional value of the building to the total value of
property. If, for example, a cottage is worth $10,000 and the land $12,000,
an $11,000 downpayment protects the financial institution from disaster
damages to the dwelling.

On the other hand, if one broaches the subject of compulsory insurance, executives do not react with much enthusiasm. They prefer to look at their industry as a service group selling a product to consumers because they want it, not because they are a "captive audience." Although this form of logic may have psychological merits, it certainly cannot be justified economically since compulsory insurance is bound to increase business for the industry as a whole. In fact, there have been few complaints from insurance personnel on the rulings in certain states forcing all automobile drivers to have liability insurance before taking the wheel. More in line with the subject of disasters, it should be noted that residents having mortgages are normally required to take out policies protecting their dwellings against fire and extended coverage damage. In this way the financial institutions safeguard their collateral in case an unexpected blaze destroys a house.

Government Reinsurance Aspect

In order for insurance to be equitable, rates must be based on the expected annual loss calculated over a number of years. To use a simplified example, suppose that past data indicate that only one earthquake every ten years will cause any damage worth calculating. Annual rates should then be based on 1/10 the estimates of destruction from this big shock. If companies began issuing insurance tomorrow and a serious earthquake occurred next year, then the losses paid out would be far greater than any reserve which the companies had been able to build up. To eliminate the need for unnecessarily high rates which would protect companies against an extreme loss in the near future, it seems feasible to institute some form of government reinsurance. By paying a certain percentage of each disaster policy to some designated federal agency, companies would be protected against any unusual losses due to a natural disaster. In other words the government would come to the rescue in much the same way as it has promised to do through the Federal Deposit Insurance Corporation, in case a bank has a run on its deposits.[1] Insurance companies would be assured that they would be protected during unusually severe years, such as 1965 with its numerous floods and tornadoes in the mid-West.

A Suggested Comprehensive Insurance Scheme

In principle, there is no reason why disasters currently receiving separate coverage (e.g., earthquakes) or no coverage (e.g., floods) could not be included under the extended coverage clause which normally accompanies fire insurance. The main problem is to develop an economically meaningful set of premiums which will be marketable as well as politically feasible.

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1. In fact, the similarity between bank insurance and disaster reinsurance might be indicated by a duplication of initials. In this case, FDIC would stand for the Federal Disaster Insurance Corporation.

Nature of the Premiums. Premiums on all existing property would have to be sub-
sidized by the federal government so that residents could afford to purchase
policies from the private companies who would be marketing the insurance. This
type of subsidized premium can be justified economically since buildings already
in the area represent a sunk cost or investment and therefore can be treated
differently from new property.

Families or businesses planning to build new structures or additions to existing
property (e.g., a new wing on a house) would pay insurance premiums reflecting
the actual risk of living in the area as determined by the Corps of Engineers
and the Weather Bureau projections from damage studies. In this way individuals
would be discouraged from undertaking new developments in high risk areas unless
the expected benefit was greater than the cost of living there.

Spreading the Risk. The government should require this modified form of ex-
tended coverage on all federal VA and FHA homes, which comprise about 20% of
the housing market. In order to induce banks and financial institutions to
force homeowners and businesses to buy this policy before issuing a mortgage,
the federal government would have to modify its current role in post-disaster
recovery. For example, the SBA would make it very clear that in the future its
relief program would be limited solely to relocation expenses if a family
wishes to move from a disaster-prone area to safer ground. A step in this
direction was taken following Hurricane Betsy when residents living in hazard
areas, who received an SBA loan to rebuild their home in the same location,
were declared ineligible for any more aid if they received future damage. Ex-
plicit policies such as these would compel banks to require this proposed com-
prehensive insurance just to protect their own investments from disaster losses
and possible declarations of bankruptcy on the part of the mortgagee.

Government Reinsurance. One of the reasons why the insurance industry has
refused to market flood policies and shied away from earthquake coverage is
the possibility of unusually large losses from a severe disaster.

It is thus necessary for them to accumulate large excess balances to protect
their equity. This problem is compounded by the U.S. Treasury's ruling that an
increase in insurance reserves is considered part of profits and thus is
subject to a 52% corporate tax.

A program of government reinsurance protecting companies against any unusual
losses would permit rates to be calculated on the basis of expected annual loss
over a number of years. The insurance industry would still market policies
just as they do for other forms of coverage but would now know that following a
series of severe catastrophes they would still be assured of financial stability.

Disaster Insurance Today or Tomorrow? Some federal agencies have voiced strong
reservations about the possibility of developing a meaningful comprehensive
system of disaster insurance in the near future. They feel that until very
accurate information is available on flood damage and losses, an insurance pro-
gram may do more harm than good in ameliorating the flood problem since un-
warranted flood plan developments would occur if the cost to the policy holder
were less than the actual risk.

From a theoretical point of view the above statement is obviously correct--a
subsidized form of insurance would lead to some new projects in flood areas
which would only be developed because benefits were greater than the sub-
sidized premium; they would not have been undertaken if a true insurance cost
had been determined. There is no denying that it would be nice to have accurate
figures to calculate the theoretically optimal premiums.

Since we presently do not have those data, the important question really is:
"Can an insurance program developed in the near future with approximate figures
(to be improved over time) lead to a greater reduction in flood plain losses
than having no insurance program until accurate rates have been calculated?"
Since the present form of disaster relief does not discourage residents from
developing hazard areas, (e.g., flood plains), it is hard to see how an
insurance program could fail to improve the situation. Because flood coverage
is not available today, the stricken victims must rely on the sympathy of the
American people and the federal government to bail them out of difficulty. In
fact, even without special congressional legislation, Red Cross aid and cheap
SBA money have produced reactions in disasterland similar to those in the
fictional Grand Duchy of Fenwick in "The Mouse that Roared": the flood or
earthquake may actually produce a bigger and more prosperous community than
existed before the disaster.

By considering the amount of money the government would save by not pouring in
grants and low-interest loans to homeowners, the total subsidy on insurance
policies for existing property may be less costly than the current program of
relief. On top of the above savings, a system of disaster insurance would
increase tax payments to the U.S. Treasury since an uninsured person can now
write off his losses as a tax deduction. For example, in 1952 a total of
$296 million was deducted in taxable returns as net losses on non-business
property resulting from destruction by fire, storm, automobile accident, flood
or other natural physical forces, and from losses due to theft.[1]

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1. Federal Disaster Insurance, op. cit., p. 266. The report notes that
private damage from flood and other disasters where insurance is not available,
can be assumed to make up the large proportion of the $296 million figure.
Since most people do insure against the other unfortunate occurrences listed
above they cannot use their losses as a tax deduction.

At the same time, the development of an insurance program today will acquaint would-be residents with the dangers of locating in a disaster-prone region. Frequently people are either unaware that they are moving into a flood plain area or take the attitude that they will be spared nature's wrath. Through an insurance scheme with premiums based on risk the individual will become acutely aware of the expected cost of living in certain regions and can then make his decisions based on the most accurate information available.

By developing an insurance system now we shall also get much better data on losses in the future than we could have obtained solely from the Corps of Engineers pilot studies, since the insurance companies will be forced to keep records on payments to disaster victims. In this way, the initially imperfect rates can be up-dated and made more accurate over time. It is not at all surprising to find that our most complete damage statistics are on hail, tornadoes, and windstorms, since these are the only natural disasters included as part of extended coverage today.

Integrating Insurance Program with other Federal Policies

In order to reduce future losses from disasters a system of comprehensive disaster insurance must be supplemented by meaningful programs of other federal and local agencies. The time to take positive action is immediately following the catastrophe when people have received serious damage to their property and are thus more amenable to change than during normal periods. For example, the SBA disaster loan program should be designed to encourage out-migration from hazard areas to safer locations. Let us consider the case of a family in the flood plains who receives $15,000 worth of damage to their $25,000 dwelling. Of course, their comprehensive insurance policy will reimburse them for damages; however, the insurance premium on the portion of their house destroyed (i.e., $15,000) would no longer be subsidized if the family chose to rebuild in the same location. This factor alone should lead the homeowner to think about moving to a safer and less costly area although he may not be able to afford it. The SBA should aid them further by offering a 3% loan to cover the difference between the insurance payment and the cost of relocating and re-building a home in a safer region. Sociologically there may be some roadblocks to change, but through the economic incentives and the flexibility to move generated by disaster damage, some success may be forthcoming.

A comprehensive disaster insurance system does not exclude the possibility of flood control projects; in fact, the two can be developed hand in hand. Dams and levees should be constructed if they can be justified from the basis of cost-benefit analysis. Future insurance premiums should be reduced after the completion of the project to reflect this change in potential damage.

Since the federal problems connected with natural disasters are so complex today it appears desirable that some official committee under the Office of Emergency

Planning be permanently set up to coordinate the work of all federal agencies
involved in recovery efforts. Following the Alaska earthquake the Anderson
Commission was established to do this job during the initial stages of recovery
although it did not have the same authority that a permanent body would have
had. By establishing a National Disaster Board it would be easier to develop
consistent agency policies regarding recovery work and flood-control projects
in disaster-prone areas.

Through the parallel development of a system of private comprehensive disaster
insurance, many of the decisions regarding rebuilding in high-risk areas could
be left up to the individuals themselves. By paying annual premiums reflecting
risk, they would then be protected against disaster damage.

Currently there is a great deal of uncertainty as to the fate which befalls
property owners in a disaster-stricken community; in some mid-West areas,
federal money was still not forthcoming ten weeks after a twister had produced
serious damage during the spring of 1965.[1]

A combination of federal and private spending as suggested above should lead to
a more efficient and equitable recovery in the future. At the same time, the
growth of disaster-prone areas will be curtailed except when new developments
can be justified from a cost-benefit point of view.

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1. See U.S. Senate Hearings on the Disaster Relief Act of 1965 (S. 1861)
pp. 37-45.

II.   MANPOWER RESOURCES--ROLE-CONFLICT AND TRAINING
Meda White[*]

Which members of disaster relief organizations can be counted on to turn out
and do their jobs in time of disaster? And if they do turn out, which ones
can be counted on to do their jobs well during the first few critical hours?

These are questions of both practical and theoretical interest. Certainly
there are no final answers as yet, but there are some provocative findings that
may provide some clues.

The findings to be taken up in this paper come primarily from two studies. The
first study concerned behavior of members of disaster-relief organizations
following the 19 3 tornadoes in Waco, Texas; Flint, Michigan; and Worcester,
Massachusetts. In this study, 126 disaster workers were interviewed for an
average of about one and a half hours each. They came from city and state
police, fire departments, city government, hospitals, news media, utility
companies, the National Guard, Red Cross, Salvation Army, and Civil Defense.
All had roles that they should have performed during the disasters. The second
study was of Hurricane Carla, that hit the Texas coast in 1961.

The purpose of this paper is to select from these two studies the findings
which seem most directly relevant to the planning of disaster relief for the
first few hours after disaster strikes. In doing this, the objective is not to
provide pat solutions but rather to present some provocative cases and to stim-
ulate discussion about what their implications for disaster relief may be.

Which members can be relied on to turn out during a disaster? This was the
central question of the first study; the one involving 126 organization members
in three cities struck by tornadoes.[1] To answer this question, one must measure
all the forces which pull (or push) an organization member toward working with
his organization. Then one must measure those counter-forces which pull (or
push) him toward performing his family role instead. Which is greater--those
forces moving him toward his organization--or those moving him toward his
family? This is the central issue in predicting the outcome of role-conflicts.

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1. Meda M. White, "Role-Conflict in Disasters: A Reconsideration," paper de-
livered at American Sociological Association conventions, 1962. (For a pub-
lished summary and review of this paper, see Allen Barton's Social Organization
Under Stress: A Sociological Review of Disaster Studies (Washington, D.C.;
Disaster Research Group, Disaster Study No. 17, 1963), pp. 54-58.

After many months of half-predictive, half-inductive analysis of the role-conflicts in this sample, a crude way of measuring these forces was devised. Each subject was given a score for organization-forces and another score for family-forces so that 100% of those who had higher organizational scores performed their organization roles first. Conversely, 100% of those who had higher family scores performed their family roles first. When the two forces were equal, some subjects did one thing, some another; often vacillating between roles. In other words, the scoring system was able to "predict" the outcome of all role-conflicts except those when the forces were nearly equal. Out of 126 cases, there were only eight for which the forces were equal.

How were those forces which move an organization member toward working with his organization measured? Put differently, what characteristics identified those organization members who, with family forces held constant, were most likely to turn out? This is a question central to the interests of officials planning disaster relief. The answer will be more meaningful if the forces moving a worker toward his organizational disaster role are presented in context; in the context of the worker's overall motivation during disaster.

It has not been sufficiently appreciated that a disaster can be a very threatening thing even to survivors who emerge unscratched. In fact, it can be threatening even to those who were not in the impact area at all. This of course is because human beings are intelligent enough and imaginative enough to realize that but for some small quirk of fate, they and their families might have been among the victims. How deeply they experience these disturbing thoughts seems to depend on two circumstantial variables. The first variable is the extent to which they identify with the victims because they know them or feel that they are like themselves. The second is how likely they feel that they might have been in the disaster area themselves, or that a small change in the course of the disaster would have brought it to where they were.

To the extent that the survivors realize that they might have been killed, they are as badly shaken as someone who has just had a close shave with death. They are left doubting their ability to survive and to protect their families. Furthermore, they see that even the community as a whole is unable to protect the lives of its citizens. Their confidence in themselves and in their community has been dealt a severe blow.

But the survivors are not left in peace to pull themselves together. Instead, they face a severe challenge, for they are confronted with the life and death emergencies left in the wake of the destructive agent. It is like a second stress in some ways, but like a second chance in others. Little wonder that they are strongly motivated to restore their faith in their own adequacy and that of their community by taking effective action against the disaster; by fighting back and winning. Hence, the widespread desire to "Do something--anything!" Hence also their strong tendency to perceive the secondary emergency as a kind of trial or test of manhood.

Naturally, it is of highest importance that they not fail during this second
chance. To put it more precisely, it is important that they not recognize that
they are failing, even if they are. To avoid failure, they prefer the familiar
and the easy jobs. The prototype of an unskilled disaster worker doing satis-
fying work is that of the rescue worker vigorously digging in some wreckage,
throwing debris into the way of other workers, quite oblivious to the diffi-
culties he is causing.

But not all people get to do exactly what they want because, in addition to the
forces pulling them toward satisfying work, there are forces pushing them in
other directions--there are, in short, role responsibilities. If responsi-
bilities push them into attractive work, well and good. But if they push them
somewhere other than where they want to go, then the subject may try to find
some way to escape his responsibility. This is not easy, for just as he can-
not stand task failure, neither can he stand role failure. He can evade his
responsibilities only with good justification. He may try to deny that there
is a need for his services. How easy this is to justify will depend on how
much clear information he has about the need. Using a different excuse, he may
say that others are as much, or more, responsible than he is and will backstop
for him. Finally, he may temporarily accept his responsibilities, but try to
transfer them. Certainly he cannot justify passing his responsibilities down-
ward, to persons less qualified than himself. He may pass them only laterally
or upward, to persons equally or better qualified than he is. The significance
of this for disaster relief is great, as will be shown later. The important
thing to remember now is that he cannot pass his responsibilities downward, for
to do that would be to fail to meet his responsibilities and failure is one
thing he cannot stand.

In summary, then, the organization member is motivated as follows: Stress
makes him want to do something, to work, to prove himself, and above all, to
avoid failure. He is pulled toward those roles which are familiar and easy.
At the same time, he is pushed by his responsibilities and his own dread of
failing them. With this understanding of the motivation of the disaster worker,
the findings about what moved him toward his organizational role should come as
no surprise. When forces moving him toward performance of his family role were
held constant, the organization member was found to be more likely to turn out
to work for the organization when he was under high stress, when he was familiar
with his organizational role, and when he had higher responsibility within the
organization. Stress raises his motivation to do something--anything. The
other two factors help determine whether the "something" that he does will be
for his organization.

Responsibility provides some push toward his organizational role in the form of
negative sanctions for unjustifiable role-failure. The higher the member's
responsibility, the harder it is for him to justify evading his responsibilities.
High responsibility makes it more difficult for him to argue that others will
backstop for him. It also makes it harder for him to transfer his responsi-
bilities laterally or upward. If responsibility may be thought of as proving

the push toward performing his organizational role, familiarity with that role provides the pull, that is, the positive attractions associated with the performance of that role.

The worker who scores high on familiarity with his organization role has many of the following characteristics:

1) He has had many years experience, preferably full-time.

2) He has mastered his job so well that what others may consider demanding he considers merely routine. (Notice that it is not skill or training per se that counts, but rather skill relative to the demands of the job.)

3) He knows from long experience what to expect from his co-workers, for he feels that they are basically in agreement with him about organization goals and procedures.

To the extent that a worker has these characteristics, he is positively attracted toward performing his organizational role.

In summary; stress, familiarity with one's organizational role, and high responsibility, all favor turnout to perform the disaster role when disaster strikes. As has been mentioned previously this scoring system for predicting the outcome of role-conflicts was derived half-predictively, half-inductively. Those who wish to know how much confidence they can have in it may desire more information about how it was derived.

Before a single interview was begun, predictions were written out. The question immediately arose as to the best way to measure some of the key theoretical concepts such as stress, responsibility, and familiarity with one's role. Whenever there was any doubt several measures of the same concept were incorporated into the interview schedule. The scoring system is inductive in two ways: First, from several measures of the same concept, the measure was selected which gave the best prediction. Second, the precise numerical value to assign to the various answer categories was derived inductively by trial and error. The scoring system thus evolved is consistent with the predictions made before interviewing began. Thus, it would seem that if stress, responsibility, and familiarity with organizational role are not precisely the variables needed to predict the outcome of role-conflicts between organizational and family roles, they are at least closely associated with the real variables.

Under way now is another analysis of this same data. This analysis is focused on how well members perform once they start working. Already it is evident that the same motivational dynamics are at work. There is a strong preference for doing things the familiar way and, more importantly, working with familiar people. There are efforts to deny evidence of failure, or, if failure must be

recognized, to deny its importance. Hence competent workers realize sooner
than incompetent ones how really widespread and serious the disaster is. The
state police captain often will know in 30 minutes what areas have been hit;
he will know because of his vigorous efforts to find out. In the same city it
may be 48 hours before the voluntary Red Cross disaster chairman knows how bad
things are, because if he is untrained, he will face facts only as they are
forced on him. In a similar vein, evidence of role-failure is ignored as much
as possible. In every instance of really intense role-conflict observed, the
respondent suppressed the conflict. He claimed that the decision about what
to do was not really his to make.

Finally, leaders who are failing may try to transfer their responsibilities
laterally or upward. For example, during Hurricane Carla leaders of several
small communities asked the state highway patrol to govern their town.[1] In
all the disaster studies to date, is there a single instance in which a leader
under stress transferred responsibility downward? None come to mind.

A good way to explain something is to give an example; an example in this
instance being a case history. First, consider the case of an unfortunate Red
Cross volunteer disaster chairman. This man had been chosen for what he
thought was an "in-name-only" job scarcely three weeks before the tornado hit.
He had never even been inside the Red Cross headquarters. When Red Cross
workers learned of the tornado, they phoned him at his place of business and
asked him to come. He came, without pausing to check on his family. Upon
arriving at Red Cross headquarters, he quickly arranged to transfer his respon-
sibility to a full-time, salaried Red Cross worker. Thereafter he served as
her assistant. When interviewed, he was flamboyant in his praise of this
woman's capabilities and insisted that the interviewer should be talking to
her, not him. He related that after several hours of Red Cross work, he learned
that one of the areas hit by the tornado was his own neighborhood. He did not
leave his disaster post and rush home. Instead he sent a courier to check on
his family, explaining that he "just felt sure that they were all right." For
two days and two nights he served the Red Cross as best he could. When asked
how long it was before he realized how bad the disaster was, he replied that it
was two days. He did not find out how bad it was until his job was over and he
went home and read the paper.

This case illustrates a number of points. First, it shows that although he had
little or no attraction for his job (being totally unfamiliar with it), the
push of his responsibilities was by itself enough to move him toward his organ-
ization job. Bear in mind, of course, that during the early disaster period
when he made his decision to do Red Cross work there were virtually no forces

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1. Harry E. Moore, Frederick L. Bates, Jon P. Alston, Marie M. Fuller, Marvin
V. Layman, Donald L. Miscner, Meda Miller White,...And the Winds Blew, (Austin:
University of Texas Press, 1964).

moving him toward his family. It was only later that he found out that his own
neighborhood had been hit. Once on the job, he transferred his responsibility
upward. He spent a good part of the interview trying to justify this action,
by showing that it really was upward (not downward) and that the worker who
took over his responsibilities really was very competent. He seemed defensive
and seemed to need to justify himself to the interviewer. When he learned
that the tornado had hit his own neighborhood, he was in quite a spot. If he
believed his family to be in danger, he would also have to believe that he had
failed in his role as father and protector; especially since he was so expendable
at the Red Cross. An accuser could easily say that his family needed him more
than the Red Cross did. Of course he preferred not to face such a role-failure.
He took both ways out: First, he denied that his family needed him (they were
really all right) and second he delegated his responsibility laterally; sending
a courier in his stead. Finally, it is significant that he was so slow in
realizing how bad the disaster was. In fact, he could not face it at all until
he had finished his disaster job and gone home, not to return. Then and only
then could he bring himself to look at the papers and find out the worst.

Oddly enough, a volunteer Civil Defense leader in another city found himself in
a similar position: He had only been in office a month when disaster struck.
His story is most revealing, but before it can be understood, one must first
understand the pattern of cooperation that existed among the various disaster-
related organizations at that time.

Most of the organizations were part of what one might call an "emergency net-
work," a network of those organizations that cooperated in handling the wrecks,
fires, shootings, drownings, and other everyday emergencies in this area. This
network included city police, fire department, state police, hospitals, mass
news media, and even utilities. Within this network there were many contacts
daily; far more than the average citizen might ever realise.

Another group of organizations might be called "disaster specialists." These
were organizations which did not usually help handle the little everyday
emergencies but were expected to play an important role in time of disaster.
This included National Guard, Civil Defense, Salvation Army, and Red Cross.
These organizations had occasional contacts with one another and with organiza-
tions of the emergency network. But their interaction was not frequent enough
to merit calling the disaster specialists a network. They were, relatively
speaking, isolates.

This was the situation, then, in which one Civil Defense leader had to operate.
He was a disaster specialist——not a member of the emergency network. In many
ways his civil defense job was undesirable. The job was part-time and unpaid.
He was furnished no office and no secretary. Many men before him had held the
job briefly, then quit. And yet he felt honored to be given the job. He was
a young insurance man in his early thirties, and an ambitious member of Junior

Chamber of Commerce. He felt that being asked to take this job meant that he was accepted by the "in" group, the local businessmen who were active and influential in civic affairs. He took his responsibilities seriously for he was determined to make good.

He had been on his civil defense job for only one month when the tornado struck. He was in his insurance office at the time. The tornado hit the very building where he was, causing the building to rock vi lently and the furniture to slide across the room. He and others rushed down the stairways and into the streets only to discover that their building was the only one in sight, still standing The damage was so devastating that he realized immediately that this was a major disaster. The tornado itself was still in sight, roaring and churning a few blocks away. As he and the others watched, it reversed its course and headed toward them. All scrambled to re-enter the building from which they had just fled. There they weathered the second onslaught in safety.

The Civil Defense leader, although under severe personal stress, acted with creditable presence of mind. He phoned national Civil Defense, the Red Cross, and the governor. Then he went back into the streets and tried to direct disaster relief.

The details of what happened then may never be known. Whatever it was, it must have been humiliating, because the Civil Defence man has refused to talk about it. He is nervous and cannot look an interviewer in the eye. His evasiveness ranges from rummaging through file drawers and making phone calls while being interviewed, to breaking appointments with interviewers and even leaving town to escape them. He is no longer active in civic affairs. Many of the leaders who know him fall silent when his name is mentioned. A few kindly souls express pity for him. The less charitable ones express contempt.

What did he do that was so bad? From his own outspoken critics comes the answer. They do not say t .at his suggestions were bad or that his advice was stupid. They do not accuse him of rudeness or bad manners. His crime was that he had the gall to try to direct the emergenc. network when he was not a member of that network and was merely a disaster specialist. The old timers within the network see themselves as the seasoned leaders: the men who run the city day in and day out. They see themselves as the men who really know the ropes. However politely he phrased his "suggestions," it was outrageous that this outsider from Civil Defense should try to tell them what to do. What is worse, he would not take no for an answer. For 48 hours he followed them around, pestering them.

What the leaders say, and they say it quite emphatically, is that they could not possibly turn over the reins to him, because that would be transferring their responsibilities downward. They knew the ropes—he didn't. They were experienced in working with all the other members of the emergency network— he was not. They were familiar with each other—but not with him. He was an

unknown quantity, a stranger. No matter if the law did require that he take
over in time of disaster——no matter if his suggestions were good——they could
not possibly justify, to themselves, giving him the responsibility. Their own
strong needs to do something, to work with old familiar ways and old familiar
people, and to live up to their own responsibilities simply would not permit
them to turn over leadership to an inexperienced outsider.

In all disaster studies done to date there has not been found a single instance
in which, during the first few hours after a disaster, leaders of the emergency
network relinquished their responsibility to an inexperienced outsider who was
a disaster specialist. This may have happened the next day, but not during
those first few crucial hours and there is good reason to doubt that it ever
will.

If an emergency network will not yield to the leadership of disaster specialists,
what can these disaster specialists do? One thing they might do is to continue
batting their heads against the wall; forever counting on having disaster
specialists take over the emergency network and forever failing in their efforts
to do so.

Another solution, of sorts, is unilateral action. For the first few hours at
least, let the emergency network go its way and the disaster specialists theirs.
This has been tried with questionable success, for reasons that should be
obvious. Yet there persists a strong tendency for disaster specialists to act
unilaterally. This tendency is so strong that in one city in which Civil De-
fense and Red Cross headquarters were right across the street from one another
there was no contact between them at all during the first 24 hours of a disaster.

A third solution would be to induce a leader within the emergency network to
accept some responsibilities in civil defense or emergency planning. During
the first few hours he would act as the community's disaster leader with full
legal power and protection. The Civil Defense leader would act as a consult-
ant to the community disaster leader, serving as his right-hand man.

A community disaster leader who had some Civil Defense training, responsibilities,
powers, and connections, would provide a vital link between the emergency network
and the disaster specialists. He would have the combined advantages of his own
intimate knowledge of the emergency network, plus his consultant's knowledge of
disaster procedures. He would have become acquainted before disaster struck
with the permanent Civil Defense man. He would know the man and be accustomed
to working with him. He would know what services and resources this man had
to offer.

The ideal community disaster leader for the first few hours after disaster would
have the following characteristics:

        1. He would belong to the emergency network.

2. He would be a leader within that network, a man of high
responsibility, and a man to whom others could transfer
responsibility and feel confident that they were transferring
this responsibility upward.

3. He would be familiar with leaders of disaster-specialist
organizations, familiar with working with them, and familiar
with what they have to offer.

4. He and many of his men would not have families in the
immediate area and hence would not be under that additional
stress. Being under less stress, they would be quicker to find
out how bad the disaster is. They would also be quicker to
recognize negative feedback and correct their efforts accordingly.
It should be remembered that while stress favors turnout, it
retards efficiency of performance.

There is a subtle irony in those conclusions about an ideal disaster leader.
These criteria, so arduously derived from theory and data, point to certain
persons--and one person in particular--as an ideal disaster leader. The irony
is that the ideal leaders are the same leaders that the victims of a disaster
spontaneously choose to follow: city officials and police, and most especially,
the state police. By intuition, common sense, or blind instincts, the public
seems to have reached this conclusion much sooner than we investigators of
disasters.

Of course this conclusion may be wrong. If it is, perhaps these provocative
case studies will help point the way to a better solution.

III. LAW ENFORCEMENT IN RIOTS AND INSURRECTION
Raymond M. Momboisse*

It is going to be a long hot summer! Many fear that we will soon see bigger
and bloodier outbursts of anarchy in the streets of countless cities in this
country.

As mob rule poses more and more threats to law and order, responsible citizens
cannot help but ask: Where are we going--are we on the brink of a major up-
heaval?

History is not reassuring. It establishes that pre-revoluntionary periods have
all been characterized by intensity of action on the part of pressure groups,
going beyond mere lobbying and propaga: 'n, by resorting to organized direct
action to supplant the government in some dramatic way.

The question is whether or not our society is at this time passing through such
a period, for in recent years there has been a fantastic increase in the number
of demonstrations, acts of civil disobedience, and wild riots. Why have they
occurred? Will they continue? What can be done? These are questions upper-
most in all our minds.

To properly study the problem it is essential that we have certain definitions
and distinctions clearly in mind. We must know what a demonstration is, how
it differs from acts of civil disobedience, and how both in turn differ from a
riot for the tactics and techniques of the police will vary with each situation.

A demonstration is a legal public assemblage of persons exhibiting, by lawful
means, sympathy with or opposition to some political, economic, or social con-
dition or movement. The intent of the demonstrators is to persuade by focusing
public attention on a problem or problems and the persons or establishments
against which their action is directed, and to publicize the procedure or be-
liefs of the organizations and persons participating.

Civil disobedience is quite different. A simple and revealing definition was
given recently by a student involved in civil disobedience. When asked by a
TV interviewer for his definition he replied: "Students working together to
force the power structure to recognize the prejudices and inequities of the
capitalistic system."

A more accurate definition is "the deliberate public violation of the law in
order to dramatize one's sympathies with, or opposition to, some political,
economical or social condition or movement." It is immediately apparent that
the terminology utilized is highly inappropriate. Obviously "criminal dis-
obedience" would be much more accurate!

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 Calif ~:.ia.

These definitions point out the basic similarity between demonstration and civil disobedience, namely, the objective which is to harass the enemy as well as to dramatize one's position in such a way as to attract attention and gain publicity. In this way public pressure is exerted on the adversary to force him to capitulate.

The difference between the two methods is far more than one of degree. It is a difference in basic morality. One espouses legality. The other flaunts it. One holds that the end never justifies the means. The other rejects this view.

Now that we have clearly distinguished the various types of activity, let's turn to the legal rights, duties and obligations.

Basic in any such discussion is a recognition that our Constitution guarantees to all citizens the right to freedom of speech, the right of assembly, the right to petition peacefully for changes in our government and our way of life. Our constitutional command of free speech and assembly is basic and fundamental and encompasses peaceful social protest, so important to the preservation of the freedoms treasured in a democratic society.

We must respect the fact that a function of free speech under our system of government is to invite dispute. It may indeed best serve its high purpose when it induces a condition of unrest, creates dissatisfaction with conditions as they are, or even stirs people to anger. Speech is often provocative and challenging. It may strike at prejudices and preconceptions and have profound unsettling effects as it presses for acceptance of an idea. That is why freedom of speech is protected against censorship or punishment. There is no room under our constitution for a more restrictive view for the alternative would lead to standardization of ideas either by legislatures, courts, or dominant political or community groups. Indeed it would do more. The silencing of one voice will inevitably lead to the silencing of others and eventually to the loss of all freedoms, for liberty can only be had if it is given to all. As Abraham Lincoln so beautifully phrased the principle; "For one to have liberty, he must be willing to give it to others. Those who deny protection to others reserve it not for themselves, and under a just God cannot long retain it." Therefore, a demonstration so long as it is conducted in a lawful manner must be tolerated. The demonstrators must and will be protected by the police from those who would interfere with them in the exercise of their constitutional rights. This is true, irrespective of how repugnant the cause they espouse.

This does not mean that acts of civil disobedience, the deliberate and flagrant violation of the law, must be tolerated. Nay, the converse is true. Civil disobedience cannot be allowed nor tolerated! There is no place for violence in a democratic society dedicated to liberty under law. The right of peaceful protect does not mean that everyone with opinions or beliefs to express may do so at any time and at any place. There is a proper time and place for even the most peaceful protest and a plain duty and responsibility on the part of all

citizens to obey all valid laws and regulations. Lawlessness, if not restrained, will eat away the foundations of government and society and replace them with rules by the mob. Thus the violators of our laws must and will be apprehended, prosecuted, and convicted.

In contrast to both these methods of protest, both of which are basically peaceful, is the riot. A riot is the violent shattering of the peace of the community. It is a wild mob on a rampage, looting, burning, destroying, killing. It is the complete breakdown of society; a return to the savagery of the dark stone ages.

Unfortunately of late these ominous holocausts have ravaged and scarred our communities with ever increasing frequency. Only last August, Los Angeles, the largest city in California, was terrorized for 6 days; 34 people were killed; over 1,000 were injured; more than 950 businesses and privately owned buildings were looted, damaged, or destroyed; over 200 structures were burned to the ground. This was the work of between 8 and 10 thousand citizens who actively participated in this tremendous upheaval. Statistics cannot convey the terror and horror of such an event. Unless you have seen a city torn, bleeding and in flames, you cannot understand what a riot is like. When you have witnessed it, you come away with one driving conviction, and that is, it must not be allowed to happen again. Yes, there is only one effective way to control a riot, and that is to prevent it from ever erupting.

Let us consider some of the steps that the community must take to prevent riots. First, it is essential that the community know what the local conditions are. This demands that there be an effective intelligence gathering organization that constantly measures the pulse of the community. In this way the warning flags of impending conflict may be observed at the earliest possible moment. This requires that raw intelligence be received from as many sources in the community as possible. Once received, it is rapidly evaluated and transformed into meaningful conclusions. This must be followed up with positive action on the part of the community to relieve the pressure that is generating the discontent.

There must also be liaison established between law enforcement, government officials, religious, social, and minority leaders in the community. By liaison we mean the close cooperation between these centers of leadership in the community. There must be an exchange of information between them; a greater understanding of the problems that each faces and the extending of assistance whenever possible.

Liaison must be established between the police and those in private security. Plans must be mutually worked out in advance for the protection of the commercial and industrial centers which are potential targets of rioters. Agreement must be reached on whether or not private guards will be allowed to remain in the riot areas, and if so, how will they be identified; what will they do; what protection will be given to them? Plans must be made for the safeguarding or

removal of large sums of money, jewelry, and irreplaceable documents in the riot area. If defense industries or key utilities are involved, utmost priority must be given to their security.

There must be detailed advance planning on the part of the police for the handling of any potential riot. This requires the training of police personnel in riot tactics and techniques as well as stressing preventive measures that individual officers should constantly be practicing.

As we have learned in recent months, when a riot erupts in one of our metropolitan areas, the demands for manpower is staggering. Indeed, they cannot be met by a local police department. To satisfy that need, the plans must include arrangements for the calling out of military units or a program of mutual aid and assistance from other law enforcement agencies. These detailed plans must be drawn long before any emergency exists for when disaster strikes you are not allowed the luxury of delay. This is but a rough outline of the steps that must be taken prior to any actual outburst.

If our preventive efforts are unsuccessful and a riot does occur, the police must respond immediately. To do so, they must have a specific plan of action. They must rapidly execute that plan. They must be firm in the execution of the plan. The basic tactical principles are to arrest the leaders and destroy the command structure of the rioters; break up the mob and prevent it from re-grouping.

The first step taken by the police in such a situation is to isolate the area of the disturbance. This is done by establishing a cordon around the critical zone--the area of the actual disturbance. This zone is in turn surrounded by an isolation zone; a buffer which is at the same time an area in which police forces are organized and in which the various police command posts are established.

The purpose of such isolation is twofold: One, to diminish the size of the mob by allowing those who wish to escape to do so, while at the same time preventing reinforcements from swelling the size of the mob; second, by restricting the activities of the mob to the critical area you protect other portions of the metropolitan area.

But the police must do more than merely isolate the area and allow the riot to burn itself out. They must take measures to protect the citizens in the riot zone. They must protect the thousands of helpless law abiding citizens who live, work, or are in the riot area. This is a lesson that has been learned at a very dear price; the police cannot withdraw from any area in our community. There are those who claimed that the police uniform antagonized the citizens of Watts. They promised that peace would be restored if only the hated police uniform were withdrawn from the danger area. This was not true. This is never true. The withdrawal of the uniform would, in effect, be a visual withdrawal of authority and a signal for anarchy to prevail; for the mob to take over and

do as it willed. This has been the case whenever the police have for any rea-
son failed to perform the functions with which they are charged: whenever they
have failed to give the people of the community the protection and security to
which they are entitled.

In this respect it is my personal recommendation that when a riot breaks out
in a commercial area, police units should be immediately rushed into the heart
of that area to seal it off and secure the entire commercial area. Rather than
merely encircling it and slowly marching units into it, a convoy of cars and
trucks should sweep from one end of the business section ∩ the other, dropping
off protective bodies of police squads along the route o1 ravel to establish
control. This will save the commercial centers. More tha.. that, by pushing
the rioters into their own residence area, such action will deprive the rioters
of their targets, for in recent riots no substantial damage was inflicted upon
residences. This tactic of rapid dispersal is particularly applicable in those
instances where the mob resorts to the use of guerrilla tactics.

Recent riots have shown that rioters no longer follow the classic pattern of
massing together in a mob and moving toward an objective. Rather, they have
adopted the technique of guerrilla attack. They attack, disperse, re-group
and re-attack. They hit those areas where there is insufficient manpower to
restrain them. They avoid any direct attack with the police if at all possible.

Unfortunately, within the last few years, this country has been flooded with
propaganda advocating violence; instructing citizens on how to construct Molotov
cocktails and acid bombs; how and where to most effectively attack the police.
This propaganda has not gone unnoticed, which means that the problem of com-
bating rioters will be magnified in the future for there is every reason to
believe that they will have leadership, direction, and technical knowledge, if
not actual battle training

In dealing with the guerrilla type of riot, the police must saturate the affected
area with manpower; break up any communications that may exist between the rioters
and the command center for the rioters, and establish protective forces around
all critical centers in the riot areas. The police must match force with greater
force, but most of all with dedication: the same dedication that motivates their
every-day performance of duty.

In dealing with the large classic type of mob, personal appeals to the members
of the group by those in whom they have respect and to whom they look for leader-
ship should be made. In these appeals the members of the mob should be requested
to disband and to desist from any further mob activity.

The next step is to show force." This is nothing more nor less than the dis-
play of law enforcement units equipped and ready to engage the mob. The purpose
is to convince the mob of the ability of the police to maintain law and order
and to disperse the mob with physical force if necessary. If the mob is so
persuaded, it will disperse. If it does not, the next step is for the commander

of the police force to give the order to disperse, but such an order should not be given until the commander has sufficient force to back up his order.

Needless to say, it is essential that an area into which the rioters are to be dispersed has been selected and that the roads to that area have been cleared of all obstructions so that the mob will have an avenue of escape. The mob should be informed of these routes. If the mob still refuses to disperse, it will be necessary for the police to use force. The police units will be moved against the mob in various standard formations; the selection of the appropriate one will depend upon the object to be accomplished. But, before you move, apprehend and remove the mob's leaders, for without leadership the mob will more readily disintegrate.

The amount of force used should be no greater than necessary, for it is not the object of the police to inflict injury upon rioters but to maintain peace and order and protect the members of society. Firearms should only be employed in self-protection and when they are employed, they should be with the intent of disabling the target. If the police are subject to sniper fire they should protect themselves by employing counter snipers.

Let us now assume that the mob has been put on the run. Once this occurs, keep it on the run and make sure it doesn't have an opportunity to reassemble. Patrol the affected area and maintain guards at crucial points that may be targets for the mob. Maintain the patrols as long as necessary to insure that there will be no reoccurrence of the mob. In some instances, this may require control for a period of several days.

I have very briefly touched some of the highlights. The control of demonstrations and riots is a very complex matter; one that taxes all of the resources and resourcefulness of law enforcement.

There is a broader aspect of this whole problem that we cannot ignore. Today, few tears are shed for the innocent victim--disregard the rights of decent society--pity the poor criminal. There is an increasing disregard for law and order enforcement. This is coupled with the new philosophy that no one is really guilty of anything. People are not guilty--just sick. Thus, the individual should not be held responsible for his personal behavior. In fact, the thinking in some quarters is that the enemy of the people is not the criminal but the police!

Unfortunately, we in America live in an age of intolerable tolerance of almost anything. We are surrounded by people who have lost faith in accepted principles: they appear to condone any and all behavior: they battle for what they choose to call "Freedom"--a catch-all label to cover self-indulgence. Indeed, many would embrace the extreme of personal freedom--anarchy!

It is time we recognize that freedom does not imply license to jeopardize the
strength of the nation, or the welfare of its people. It is time we publicly
acknowledge that personal liberty and personal responsibility are two sides
of the same coin. Without both we can have neither. For every freedom and
right enjoyed by us, there is a corresponding ratio of responsibility. Re-
sponsibility to ourselves, to our fellow man, and to our nation. It's time
we stop apologizing for the guilty and begin protecting and sympathizing with
the victim. Now, more than ever before in our history, one is either for law
enforcement or he's against it. He's either for mob rule or he's for the law.
He's either for America or he's against America. If the overwhelming majority
of people in this country do not speak out for what they believe, if they do
not insist that law and order prevail, then I fear the fulfillment of the
prophesy made over a hundred years ago by a famous British historian, Thomas
Macauley. He foresaw the early demise of the American republic when he wrote:

> "Either some Caesar or Napoleon will seize the reins of government
> with a strong hand--or your republic will be plundered and laid waste
> by barbarians in the twentieth century--but with this difference:

> "The huns and vandals who ravaged the Roman Empire came from without
> Your huns and vandals will have been engendered within your own
> country--by your own institutions."

It is the responsibility of each of us to disprove this fearsome prophesy!
Each of us holds for a fleeting moment our great American heritage. Want it
or not--like it or not--it is our responsibility to leave this great nation
a little bit better than we found it. The challenge is great but we can--we
must--we shall--meet it!

DISCUSSION OF PAPERS ON EMERGENCY OPERATIONS RESOURCES (PANEL TWO)
                                                Ralph Turner*

I warn you in advance that my comments will undoubtedly be somewhat disjointed
because I only had the opportunity to see one of these papers before the talk
today. The other two are as fresh to me as they are to you. The one which I
had the advantage of seeing is the paper that I am least qualified to evaluate;
the one by Mr. Kunreuther. I am a sociologist so I will try to comment a little
on the social aspects in Mr. Kunreuther's discussion, but I'll have to leave
aside the question of whether his analysis of the economic indexes, and of the
relationship between labor and capital is correct.

In his paper he made reference to the fact that there has been a marked change
in attitude, from 1906 when people were reluctant to accept disaster relief,
to the present when they're all looking for it. There is still some variation.
I recall the rather amusing experience when the Red Cross attempted to set up
a disaster relief center in connection with the great Bel Air fire a few years
ago. The embarrassment of having centers and no one to cater to led perhaps
to some redefinition of the notion that all disasters are alike. I also had
the occasion to chat with a boy who had been in Juvenile Hall at the time that
this was going on. He assured me that the attitude of the rank and file em-
ployees in Juvenile Hall was simply that this couldn't have happened to a better
group of people. The attitude of universal compassion is not present in all
disasters!

Mr. Kunreuther has already noted that disasters are of many kinds and evoke
many reactions, and that it would be dangerous to generalize excessively on
the basis of one such case. I am sure that the deep concern of the nation for
our new state and perhaps a sense of guilt over the long period that we've
maintained them in a semi-colonial condition had something to do with the tre-
mendous willingness to extend great resources. Also Alaska stands as a bastion
against one possible route of invasion from Russia. So, I think there were
special circumstances in this case. It may have done the United States as a
whole more good in terms of morale and assurance in regard to our national
security to have poured excess resources into Alaska than the moral harm we
did by rewarding the wrong people.

From a sociological point of view it was very interesting to note, as Mr.
Kunreuther did, that there were a good many innovations in production that
were available for general use in Alaska, but which had not been employed
earlier. The disaster was the occasion to break down conventional resistances
to their use. The illustration of people going to work year-round, rather

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 California at Los Angeles.

than engaging in construction only in the summer months, is the case in point.
This is a generalization that is well supported from many other studies of
unusual events--not just disasters--but almost anything that breaks up the
established order. People become committed to established ways of doing things,
and the cost of making a change is greater in the short run than the benefits
derived. So even though one recognizes the ultimate value of making a change,
one puts off the date when one will have to encounter the initial loss. I
suppose this is like a college professor revising a textbook: he knows that
the first year after revision there will be costs which cut into his royalties.
Hence he puts revision off year after year. This is a much more general phe-
nomenon than reaction to disaster. War clearly had the same effect. The great
advances in technology that come with war are often caused by overcoming re-
sistances to adopting procedures which were available for use long before.

The major question that Mr. Kunreuther has raised about the moral consequences
of disaster relief is an immensely interesting one. But again it is not one
which is peculiar just to the disaster situation. In fact, as I listened to
Mr. Momboisse's talk I was struck that he was saying the same sort of thing,
with respect to the response to demonstrations. If you are peaceful and law-
abiding, nobody comes to your banner, but if you create a little trouble money
pours in for your support. There are many ways in society in which, whether
we want to or not, we reward those that we would prefer not to reward. Often
this is not at all a result simply of public policy. For instance, at the
beginning of World War II here in Southern California, there was a sudden open-
ing up of employment opportunities in war industry. Now who were the people
most likely to take advantage of these new opportunities? They were not likely
to be the people who had secure positions--who were already established in a
satisfactory type of work. They were more likely to be the people who had
relatively little to lose by taking a chance on what might turn out to be im-
permanent work. Well, as we now know, those people who took advantage of war-
time opportunities were, for the most part, the ones who benefited. Wages went
up, the industries expanded, workers developed seniority quickly and were in on
the ground floor with respect to the major industrial developments of Southern
California after the war. Those people who had secure but modest positions
were, therefore, stuck with them and indirectly penalized. This is a similar
kind of phenonenon which is not a result of public policy, but of the working
of social and economic processes. Hence it would be unfortunate to look at
Mr. Kunreuther's dilemma as an isolated sort of problem.

Why do we encourage people to go back into the areas that are disaster prone?
Clearly we do it because it is the easiest thing to do. Furthermore, we're
caught by the fact that we have two different terms of reference. On one hand,
we believe in the principle that people should be rewarded for their prudence
and for their activity and for their thrift, and that persons who don't exibit
these qualities should not be. On the other hand, we believe in the operation
of a general welfare principle, and no matter how strongly we say "let people
choose and then suffer the consequences of that choice," we are not in fact going

to follow such a course. For instance, we go to greater lengths to avoid inflicting capitol punishment on most of the people who legally "deserve" it. There are many areas in our society where we take a firm decision and say, "if you do wrong you're going to suffer the consequences." But in practice we can't stand by our decision, because the amount of misfortune that would be involved is so great that it would undermine the stability of our society. We cannot sit by and let those people wo do not have insurance suffer because of the amount of unrest it would create, because of the effects upon the purchasing power in our society, and because all of us are somewhat insecure in our relations to society. We are all fallible: we take out insurance here and there, but we cannot secure complete coverage. We know that no matter how carefully we try, at some point we're going to make a mistake, that we live in a world which often demands more wisdom than most of us can maintain. And so almost inevitably we fear the possibility, if we are being realistic, of some sort of a disaster which is a result of our own misjudgment. Now in these circumstances it is terribly important that we have some kind of assurance that society has a soft side to it, a side that is not willing to stand back and say, "Well, it is your mistake and you must take the consequences!"

I think Mr. Kunreuther is quite right in pointing to the insurance solution, though whether it is economically feasible or not, I am not in a position to judge. In some societies the problem is handled by moral suasion: we simply condemn the person who isn't prudent so strongly that he can't withstand the pressure and he accepts the obligation to look after himself. Clearly, unless we can see, in the reasonable future, some prospect of our society returning to a Puritan kind of ethic, it is clear that this solution is not open to us. The solution of tolerance, freedom, and compassion for individuals is much stronger in our society. Perhaps, then, the only alternative is to approach this matter as we have done on employment insurance, automobile insurance, and the like, by making it compulsory. Then there ceases to be any problem of unequal suffering and unequal support. We simply share the risk and we say that everyone must participate.

Now let me move to the second paper. I found Meda White's paper very interesting. There was a great deal of meat in it, far more than I was able to absorb in the brief reading time. And so my comments will undoubtedly not do justice to the main theme which she was advancing. As I listened to the paper with you, there seemed to be two questions dealt with. One was the problem of anticipating who, among those involved in the official role in disaster, will choose to follow the official role rather than the family responsibility role. The second problem, which was certainly intended to help supply an answer to the first, had to do with relations between the established emergency network and the so-called community disaster specialists. So let me try to address my comments to these two matters.

First of all, I want to simply suggest a caution regarding Miss White's reference to predicting who will accept the official role rather than the family, and who will not. I think she may have given a somewhat faulty impression by virtue of the rather concise form in which she presented her material, so what I'm saying is not to disagree with her, but simply to amplify what she would have said in a fuller account. Any time, in the social sciences, that you hear someone speak of being able to predict 100%, the experienced researcher raises his eyebrows because there is no such thing. Our predictions by the best methods available to us are very, very, imperfect and allow great error. Indeed we feel tremendously reassured when we are able to bring in a prediction device which will enable us to reduce our error over just simply guessing by 10% or so. I take it, then, that what Meda was speaking of is a matter of taking a set of indexes from data she had at hand and organizing those indexes so that they corresponded perfectly to the outcome, except for that group of middle cases where the two tendencies were perfectly balanced, and unpredictability remained. The real test in predictability is not whether you can take a set of data and organize the information you have into a consistent pattern. The real test of predictability is whether you can then take this formula and get a new set of data and make the predictions work perfectly. Now I would guess, if that second test is done, that there would be considerably less perfect prediction.

I would like also to raise a perhaps nit-picking kind of question. I couldn't be sure, without seeing the data, whether we were in one or two instances being given unnecessarily devious explanations for rather simple things. We were told, for instance, that our volunteer disaster director in the first illustrative case failed for several days to recognize the seriousness and extent of the disaster. And if I understood correctly, the explanation here was that this lack of recognition arose out of a <u>resistance</u> to recognition. If he recognized the extent of the disaster he would then have to acknowledge a responsibility to family, and he would also have to cope with the problem of being less than adequate himself. I think one might explore the simple explanation that he was just inexperienced and didn't know what the score was, before seeking explanations of this sort. Perhaps there are data to back up the more complex explanation.

The same query applies to why people go on working in the familiar way rather than trying new and more effective procedures during disaster. It seems to me perfectly rational to suppose that if you want to get something done in a hurry and you have some experience, the odds are that you will be more effective if you do it in the old way than if you try a new way. I don't think we need to go back to the explanation that workers resist the new, and that they resist the disaster director's unfamiliar procedures because of some attempt to protect themselves from recognition of the possibility of failure, and so on. It seems to me, in fact, that it may be wisest to proceed along familiar lines in an emergency.

The second question had to do with the problem of relations between the network and the disaster specialists. Now, this is surely a crucial problem in disaster operations, but I wonder if it is not simply a special case of a more general problem that applies in many other areas. Perhaps I'm acting like a sociologist in the sense that every time I see a special problem I suspect that we might get insight by considering whether there are similar problems in other areas that we're already familiar with. Frequently--and again this may be a professional bias--it may not be a bad idea to sit in the armchair and discover what something is like and bring to bear what we already know about analogous phenomena before we rush out into the field. I wonder whether this issue is not more a problem of the relationship between the amateur and the expert which is so characteristic a problem in our society. A society which, partly through our democratic ideals and partly through problems of coordination, leads us to put the amateur over the heads of experts.

I recall my experience as a "90-day wonder" at the time of World War II. I suppose most of you here are old enough to know that a 90-day wonder was a young man commissioned because he happened to have the appropriate college degree, put in uniform and given authority over people. In my case I was immediately shipped off to Boston and put in authority over two civilian department heads in the Boston Navy Yard. One of the department heads had been on the job for 20 years and the other for 16 years. I can tell you that I don't have to think about disaster situations to sympathize with the so-called disaster expert that Meda was speaking about. It is something like the problem of the police commissioner over the police chief in city government. In the normal course of things these relationships get ironed out in practice. As I recall, walking into the Navy Yard, I tried out my authority a little bit and when I sensed that I was about to make an idiot of myself, I retreated. After two or three weeks, the civilian people and I began to understand each other and we established a relationship in which I played the part reasonably appropriately--I let them run the Navy Yard and didn't interfere with our war effort any longer! On the other hand, there were some very important things that I could do. I did have some understanding of broad Naval policy which a man in such a specialized position would never have. I understood some things about the way to establish effective relations with other groups. I found that my role as a mediator between the employees of the Navy Yard and the British officers who were coming there to pick up lend-lease ships was an extremely important one. This was a kind of relationship in which the Boston Irish employees were totally incapable of coping in any effective way. But, you see, I had a few weeks to iron relations out. In a disaster you have no time. I think Meda has made a very important point; that we need to involve what I would prefer to call the amateurs and the experts long before the disaster takes place, so that some of these relationships can be ironed out well in advance of the real situation. Also, I suggest that researchers in the disaster field might learn a great deal about this process by moving over to a study of other organizational phenomena that have been examined from this point of view.

It is difficult to comment on Mr. Momboisse's paper because no one could dis-
agree with the sentiments that he has put forth. We're horrified by riots,
and we must do something about them. The technical question of which kind of
gas it takes, and how many guns you need, and how to get them, is a question
which from my ivory tower at the university I happily turn over to the experts.
Not having an opportunity to read the paper in advance, I did get hold of the
riot control manual which Mr. Momboisse prepared, and I found it a fascinating
document that came up to high standards with regard to knowledge of the riot
process and the steps involved in its evolution. Indeed, I must say, because
I am now going to be a little bit critical, that I was much happier about the
riot control manual than I was about the paper.

In his manual, Mr. Momboisse has given us some very specific procedures, which
I think are excellently laid out. In his talk to us today, perhaps because of
the shortage of time, he preferred to preach. And its not at all clear to me
that at this stage preaching is going to do us a great deal of good. I was
particularly sorry to see him escape from a very real and profoundly difficult
issue into a simple presentation of polar types. If what we had to deal with
was simply a problem of the good guys versus the bad guys, then indeed our
mandate and our solution would be clear. It is sometimes easier for us to do
the difficult things that have to be done in riot control if we're able to
think in these simple terms. But I don't think, here in this room, we need to
think in such simple terms. For example, we have a sharp distinction made
between procedures which involve violation of the law and those which do not.
And we have a sterling call against violations of the law. But keep in mind
that part of the background for present disturbances has been a positive dis-
crepancy between two levels of law--a positive discrepancy between the law of
the land as set forth in the Constitution of the United States and interpreted
by the Supreme Court, and the law of the land as put forward in particular
states. Only yesterday the California Supreme Court overturned a legal action
effecting the rights of minorities in this state on the grounds that the people
of the state of California overwhelmingly took action contrary to the spirit
of the American Constitution! Now at a time when we're involved in discrepancies
between laws at different levels, it is very difficult to reduce this matter
to a simple problem of surpressing law violation.

Furthermore, let me remind you that our whole system is established in such a
way that in order to invalidate an improper law it is frequently necessary that
someone violate that law. It took some chicken ranchers who violated the NRA
back in the Roosevelt era to get a Supreme Court decision invalidating that law.
Now I suppose if the Supreme Court had not upheld the chicken ranchers they
would have been wicked law violators. But since the Supreme Court upheld them,
they became heroes in support of our constitution. But whether they were vil-
lains or whether they were heroes, whether what they did was something admir-
able or something evil, was determined by a decision which could only be made
after they took their action. A similar dilemma suffuses many of these demon-
strations today. The Berkeley riots cannot be understood apart from their

relationship to the sit-ins and other activities in the South, when efforts
were clearly being made to prevent people going from the universities to the
South to bring about changes in legal patterns there to conform with the Con-
stitution. The moral aspects of the whole issue became very muddled. Note
that I don't take side of the rioters in Berkeley--I think they made a gross
mistake. But to interpret the matter in these simple terms is unfortunate and
does not contribute to a solution, but indeed tends to forstall the kind of
thinking that is necessary to approach a solution.

One further remark with regard to the rioting. We were told that there has
been a move toward guerrilla type warfare in rioting rather than the mass move-
ment on a particular object. I think perhaps this should be placed in broader
historical perspective. There has indeed been a trend in race rioting in the
U.S. during the course of the 20th Century. The riots in the earlier part of
the century were attack by whites upon Negroes, in which Negroes did not re-
taliate but tried to escape. As this period passed we came into a period when
there were pitched battles as the whites attacked the Negroes and the Negroes
retaliated. As that period has passed we have moved more and more into a
period in which it is the Negroes now who initiate violence, and the whites
either get out of the way or are kept out of the way, and do not retaliate.
The violence that we're seeing is, of course, abhorrent. But it would be un-
fortunate to think that somehow or other because it is now the Negroes who are
engaging in violence, it is entirely different and much more terrible than the
long history in our country of violence by whites against Negroes. For over a
century we have had a history of violence revolving around our race-relations.
For us suddenly to look at this as something new and different because of the
change in the pattern is to take events out of perspective. Indeed, we must
take many of the resolute steps that have been talked about here, and clearly
we must not confuse the analysis of the underlying causes of the riots with
our action in suppressing the riot when it is taking place. Clearly we must
control a riot with no attention to whether the riot may ultimately have some
ideological justification or not. Indeed, I suppose police have occasionally
been inhibited because they were worried about the justifications of the riot.
But with regard to the long range problem of controlling these phenomenon, we
must understand that the relations between the races have been a source of
violence for a long time and that they undoubtedly will continue to be a source
of violence. What we're seeing now is only different in the sense that it is
the Negroes who are becoming adept at rioting, and not just the whites.

PANEL THREE

PLANNING

I. PLANNING FOR EMERGENCY OPERATIONS
Kurt Lang[*]
Gladys E. Lang[*]

INTRODUCTION

A common characteristic of all events and situations designed as emergencies
is that they call for unusual efforts by individuals and/or an unusual com-
mitment of resources by organizations and communities, often with little
advance warning. Accordingly, when we treat a breakdown or a mechanical
failure, an injury or a major disaster, a disruptive event or a massive civil
disorder, or any other potentially damaging circumstance as an "emergency,"
we do so, not because of the special and spectacular nature of the event, but
rather because we anticipate or observe effects of a scope and intensity that
lie beyond the capacity of routine remedies. The point, on which we rarely
insist in everyday discourse, is that the emergency character of a situation
inheres in the extraordinary and extreme demands called for; demands that can
be met only by a considerable amount of improvisation and that threaten to
seriously tax the capacity of some organized behavior system.

ELEMENTS AND STRATEGIES OF PLANNING

The above distinction between an emergency and the event or external circum-
stances that act as its precipitating cause is the point of departure for our
discussion of planning. To plan means essentially to create a structure with
prescriptions for dealing with a range of anticipated contingencies. Elements
within the structure of any plan include: (1) an ordering of goals in terms
of some scheme of priorities; (2) the allocation, within the framework of
these priorities, of available resources to achieve these goals; and (3) the
development of routines in anticipation of contingencies whose characteristics
and requirements can be predicted. Allocations are made within a structure
that defines and limits the area of discretion within which spur-of-the moment
decisions with far-reaching implications must be made. The basic goal of
planning for extraordinary circumstances, it can be stated categorically, is
to prevent them from creating an emergency.

Routines as well as clear definitions as to when they are to be applied are
more easily developed where the occurrences with which they deal fall within
the range of normal everyday experience. In hospitals, for example, the
handling of "emergency" cases follows routine procedures. A fire, though an
emergency for its victims, is part of a fireman's daily work. A community will
develop plans for coping with "emergencies" when they recur. Thus, mining towns

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are better equipped on all levels to cope with situations that constitute a disaster. The extraordinary circumstances develop into what we have called an emergency only if inefficiencies, shortages, impending breakdowns, and so forth disrupt the usual means for coping with them.

Advance preparation and planning to improve performance in what may become an emergency reflect either a specific or a general strategy. A specific strategy presupposes that the major elements in the situation can be predicted in advance. Hence a plan will identify the objectives to be achieved, allocate priorities, prescribe the risks and costs to be incurred, and fix the appropriate procedures. In addition to anticipating as much as possible the precise contingencies within the situation, there must be routines for the quick and effective communication of information so that the needs and the resources to meet them can be quickly and accurately assessed and fitted into the order of priorities. Finally, there will be advance rehearsal cf procedures deemed to constitute adaptive responses to those elements that can be anticipated. Any specific strategy involves a prior commitment and hence imposes some degree of rigidity.

A general strategy, by contrast, is geared toward flexibility to cope with the very elements that cannot be predicted in advance. Here the emphasis in planning is on a general priority of goals, with the allocation of resources and the means of achieving specific goals left to the discretion of those in the best position to judge. Measures embodying a general strategy are, above all, designed to stimulate resourcefulness, either by training in the solution of novel problems or by providing special incentives for innovation and initiative. The most troublesome task is to coordinate the adaptive responses spontaneously made by individuals and subgroups with one another. Lack of control may lead to complete breakdown at the community level, even while subgroups are effectively reacting to some of the unanticipated elements that caused the emergency.

THE EMERGENCY AS COLLECTIVE BEHAVIOR

Plans for operations under extraordinary circumstances, when influenced by social research, have usually taken the disaster as a model. Hence the focus has been on how to organize and effectively plan for rescue and other activities specific to the cause, nature, and impact of the disaster—the two-fold goal being to improve performance while preventing, limiting, and overcoming any disruptive behavior. In this respect a great deal of practical experience has been accumulated by groups whose members (like those in the various protective services, the medical and para-medical professions, and certain volunteer organizations) normally participate in so-called emergency operations. We could not possibly summarize all the lessons to be drawn from their experiences and this paper will make no attempt to deal with the technical aspects of these operations. The approach of this paper is different. Its perspective is analytic rather than prescriptive. Specifically, it endeavors to come to grips

with some general problems relevant to planning and does so within the theoretical framework of collective behavior.

Collective behavior is that field within sociology that deals most explicitly with the sequences and patterns of interaction that emerge in problematic situations of all types, emergencies being but one illustration. A situation is problematic insofar as the conventionally shared expectations break down and participants therefore lack adequate guides for orienting their conduct. Specifically, the presence within a situation of novelty, attrition, crisis, choice, competitiveness, conflict, or any combination of these, contributes to the problematic and collective behavior in these circumstances. Such behavior is inevitably bound more closely to what participants feel and directly experience at the particular moment than behavior in situations more completely structured. These same elements of novelty, attrition, crisis, choice, competitiveness, and conflict can also contribute to the partial breakdown of structured activity in extraordinary circumstances. Each of these elements and its bearing on the planning of emergency operations will be discussed below. Responses under these conditions before routines are reestablished, are viewed as collective problem-solving.

In terms of this perspective, let us probe a little more deeply into the conceptual distinction between an emergency and the event or extraordinary circumstances that act as its precipitating cause. Any emergency caused by an external event (i.e., a flood, a blackout, a Presidential assassination, etc.) can be further aggravated by ineffective problem-solving activity, whose disruptive effects pose additional problems—especially if the behavior of individuals or collectivities interferes with a remedial response. In other instances, however, the emergency is solely a function of the disruptive behavior itself. Civil disorders, traffic snarls, or hysterical epidemics can precipitate an emergency with the activities taken collectively, rather than some external event, as precipitating cause.

It may be useful to view the two types of emergencies—the one where disruptive behavior enters as a dependent variable; the other where it functions as an independent variable—as two successive phases within a sequential chain. This follows on the simple postulate that all disruptive behavior can be related to some set of antecedent conditions, even if their bearing on the behavior is not directly visible. For example, reports on what caused civil disorder in the Watts District of Los Angeles, which clearly brought on an emergency, identify a wide range of events whose cumulative effects, operating over time, provoked the outburst. Emergency operations obviously did not deal with these causes because, at the time, their exact nature was not clearly recognized and they could not, in any event, have been eliminated by decisive action on the spot. In other instances, however, the time sequence with which events occur is greatly compressed, the precipitating events highly visible, and the disruptive behavior likely to cease with decisive remedial action aimed at the removal of the cause, as in many kinds of disaster.

In the second phase, the behavior itself rather than the precipitating events
stands out most clearly. The assumption here is that some disruptive behavior
is characteristic of every emergency because the type of collective response
to be made is itself problematic. Thus every emergency involves individual
behavior, mass behavior, and organizational behavior that are in some way
responses to the underlying problem, but that may at the same time contribute
to the disruption of routines.

We turn now to the problematic situations that underly all collective behavior
and spell out some implications they have for the type of response to be
anticipated under extraordinary circumstances. Taken up in order are: the
importance of the degree of novelty; the effects of the extreme nature of the
demands that, in different contexts, can culminate in attrition or crisis; and,
finally, the implications of a variety of conflicts involving choice,
competition, and mutual antagonism (intergroup conflict) that are at least
endemic in any emergency.

THE DEGREE OF NOVELTY

Not every emergency is novel. Some emergencies--like hurricanes on Eastern
ocean costs, cave-ins in coal mining towns, or breakdowns in New York City's
subway trains--are so recurrent that many participants have had prior experi-
ence with similar situations as either victims or rescuers and hence know what
to expect and what to do. At the other extreme, there are events so extra-
ordinary that no precedents can be found in the experience of those affected
and no adequate organizational routines can be developed in advance to cope
with them. The degree to which any emergency involves novel elements creates
problems of defining the nature of the event, of what the appropriate response
should be, and of the first in relation to the second. These have implications
for behavior on the individual, the mass, and the organizational level.

On the level of individual behavior, inaction and inappropriate responses are
more often encountered when the event is unprecedented. One kind of maladaptive
response, identified as the "disaster syndrome," is exhibited by many survivors
of major disasters who manifest extreme indifference and apathy, even after
the first shock of impact wears off. The occurrence of the syndrome also hinges
on the extreme degree of stress suffered, the suddenness of the impact, or the
severity of the loss, against which the apathy is a defensive reaction.

However, the degree of novelty probably affects the likelihood that effective
psychological defenses against stress and loss have been developed. Thus the
"disaster syndrome" is less often observed where the extreme circumstances are
more or less familiar. In London, where raids and expectations of raids became
routine, humor during the period of protracted bombing (of which there are many
illustrations) served as an important protective device.

Inaction may be inappropriate because the special nature of the circumstances

is not recognized. During the Great Blackout in the East in 1965, people tended to respond as they would to any sudden power failure; many of them did not turn to their transistor radios, hunt for candles, or do anything to pre- pare themselves for what proved a long night of darkness. Yet inaction is inherently neither inappropriate nor pathological. In the same blackout (so a Cornell researcher found) travellers entrapped in stalled subway trains followed an old and familiar routine by suffering the breakdown in glum silence, waiting for the trains to move again, "virtually no communication emerged with- in the subway cars, even after transit workers made their way into the tunnels to describe the situation to them."

Some kinds of inappropriate response to false cues do not occur as an individual matter but depend on reinforcement en masse. Mass retreats or mass evacuations where objective circumstances evidently did not warrant such action invariably have been sparked by one or several persons whose behavior affected others so that immediately thereafter flight became general. In a novel situation, where many participants lack the background to assess what is going on, the tendency to misread cues is accordingly greater. In these same circumstances, inter- actions among masses of people can produce improbable rumors. The less familiar the event and its probable effects, the more these will be believed.

Knowing where to turn for reliable information helps scotch some rumors. The role of transistor radios in keeping participants informed about the overall situation has been noted in such diverse events as the military uprising in Algiers, the March on Washington, and the 1965 Blackout in the East. However, media coverage can have contrary effects, depending on how the news carried is interpreted. In several instances known to us, on-the-spot radio coverage of civil disorders helped to inform would-be recruits to unruly mobs where they should go to stir up trouble.

Novelty also can leave officials and heads of key organizations uncertain as to how to respond. The most frequent failure is a delay in committing personnel and resources to emergency operations. Once committed, however, the actual imminence of the emergency can easily be exaggerated. This has particularly tragic consequences when police forces are moved into action and, misreading the danger inherent in the situation, use excessive force on peaceful demon- strators whose real intent is poorly understood. The well-chronicled shooting at Sharpeville in South Africa stemmed from an inability of police forces to cope with the novelty of peaceful organized protest by natives against a new and more restrictive pass policy.

Advance planning must therefore take account of the unanticipated and novel elements that inevitably occur in any set of circumstances sufficiently non- routine to create an emergency. Organizations cannot plan specifically for things they do not know will occur. However, the appearance of novelty can be minimized (so far as the mass of participants are concerned) if in the dissemi- nation of information, familiar though relevant rather than extraordinary

elements are stressed.   General provision for the rapid and accurate assessment
of the total situation at some central point is, of course, imperative. But
precisely because an occurrence appears novel to most people, ways must be found
to make it appear as manageable. This means, among other things, (a) proposing
specific things people should do, especially acts that have immediate practical
consequences, and (b) incorporating volunteer activities that spring up within
the total community effort by providing resources, information, and recognition.

ATTRITION

An emergency that is prolonged quickly loses its novelty, and attrition begins
to become the major source of breakdown. Attrition is a gradual wearing down,
a weakening of the motivation to support unusual effort. Some element of
attrition is bound to be present in all but the most short-lived emergencies.
This is because the special effort required cannot be sustained indefinitely at
the required level of commitment without some breaks in efficiency. Hence the
persistence over time of an apparently irremediable difficulty or of a pro-
longed threat or deprivation, progressively leads to apathy and other forms of
demoralization in which private goals begin to gain ascendancy over the cooper-
ative effort.   During such long-lasting difficulties as epidemics, chronic
unemployment, prolonged bombing raids, and persistent threats of a major catas-
trophy, attrition will produce side effects that are disruptive of group efforts
over the long run.

The effects of attrition in an individual are manifest in a variety of ways.
Let us first take the case where a continually threatening possibility fails
altogether to materialize. Measures designed to keep focal the threat will not
suffice to maintain vigilance, because the threat ceases to be real. On the
other hand, continuous operations under extreme conditions, where the threat is
constantly reiterated by everyday occurrences, gradually erode the motivational
supports on which the capacity to withstand severe stress is founded. The pro-
gressive failure of emotional adaptation is evident in increasing irritability,
hostility, and other "startle" reactions, because direct confrontation with the
possibility of personal loss or injury can no longer be avoided. Strong social
inhibitions facilitate the conversion of the accumulating affect into psycho-
neurotic symptoms, with their open expression in clearly deviant behavior as
an alternative should these constraints lose their efficacy.

Attrition becomes a mass phenomenon when these effects occur in many individuals
all at the same time. In the case of a persistent potential threat, the sense
of danger comes to be minimized by a growing collective disbelief about the
actual possibility—as for example, the illusion that war is impossible (actually
"unthinkable") because our weapons are too destructive. By the same token, the
cumulative irritability aroused in circumstances that involve extreme danger or
unusual effort is sometimes converted into a collectively shared hysterical
belief that interferes with effective remedial action directed at the real source

of difficulty. Collective beliefs can also be expressions of growing irrita-
bility and provide justifications for its displacement in hostile action
against visible and available targets.

Attrition is, at the same time, an organizational phenomenon. Its progress
can be indexed by a rise in various kinds of deviancy after periods of cumula-
tive stress. To cite an illustration: military psychiatry recognizes that
neuropsychiatric casulaty rates of units follow certain patterns. There is a
gradual but steady climb once the days of continuous combat exceed a tolerable
limit. More sudden increases occur after a unit has suffered heavy casualties
or when the unit commander begins to "crack up." These rates are group
phenomena and their effect is cumulative. There is a progressive erosion of
the interpersonal and formal organizational controls by which deviant tendencies
are kept within tolerable limits.

In planning, one recognizes that there are peaks of efficiency and that, once
these are passed, neither extreme vigilance against a possible threat nor
extreme effort to overcome an extraordinary situation can indefinitely be sus-
tained. Most generally, such an observation implies the need for explicit
provisions to prevent unavoidable deviance from having adverse effects on the
motivation and performance of others. Such provisions include a system of
rotation and relief that finds acceptance because it is in accord with norms
governing the allocation of risk. At the same time, there must be special
channels for removing deviants and giving them less demanding roles that at
the same time offer opportunities for therapeutic activity. Extreme disciplinary
sanctions lose their efficacy after a while; caution must be used in their ap-
plication and due regard paid their acceptability among personnel facing an
identical situation.

A closely associated problem is that of projecting the correct situationally
oriented role-models. Playing up heroic action during a disaster, when such
action has little utility, can have disastrous results. The limitations of
heroism were brought home to Negro leaders who, during recent incidents of
violence, exhorted rioters to go home and found themselves objects of the crowd's
wrath. Nor did the heroic escape role, which the press is so prone to play up,
help the POW interned in a strange and hostile country where racial character-
istics precluded the possibility of successful disguise. Less dramatic acts
must be given their due importance. Thus tips on taking care of one's own feet,
broadcast during the New York transit strike were more helpful than the drama-
tization of individuals who had traversed unusual distances, a feat that most
people could not have matched nor sustained over the long days of the strike.

CRISIS

Extraordinary demands during an emergency create a crisis when a point is
reached where they strain the capacity of some organized system to make an
adequate response and it is on the verge of breakdown from the overload. Where-
as attrition is a process of unavoidable deterioration operating over time, the

crisis, by contrast, identifies a point at which demands begin to exceed capacity and the success of an operation is jeopardized Difficulties in mobilization may mean that point of crisis comes early in an emergency. Often, however, the point of crisis is reached only after reserves have been depleted and attrition has undermined the effectiveness of the control structure. The symptoms of a crisis situation are the sense (a) that things are getting out of hand, because of confusion, failure to establish effective communication, and non-coordination of activities; (b) that resources are being depleted and will not suffice; and (c) that the time available for remedial action is running out.

The concept of crisis can only be applied to a behavior system, i.e., an individual or an organization. There is nothing corresponding to the crisis on the level of mass behavior. A sense of crisis in an individual that is provoked by a fear of failure rather than of personal loss or injury usually leads to emergency mobilization. On the organizational or community level, disaster, riots, strikes, etc., are sometimes not treated as emergencies until they have reached the crisis stage, even though the whole point of emergency operations is to prevent the crisis from occurring by providing mobile reserves to be committed as needed.

Planning to prevent a crisis has a built-in danger: uncertainties in the external environment that cannot be predicted or controlled result in an over-concern with the problem of internal order. The new rigidities so created could interfere with a fully adaptive response.

This concern with internal management exerts pressure to adopt specific strategies and elaborate regulations to deal with every conceivable emergency situation. Detailed procedures, though useful up to a point, can lead to an over-rehearsal of roles that is apt to stifle initiative and reduce the capacity for innovative action. A study of a tornado has pointed to the inappropriateness in an unanticipated emergency of medical activity governed by habits and practices designed to treat the type of emergency case that is routine in normal hospital operations. Best able to adapt to the extraordinary demands of the situation were physicians with prior front-line service. They were more ready to disregard and deviate from standard practices. Organizational resources and effort may also be deflected from external contingencies into record-keeping, which assures its managers that all is in good order, or into creating a public image, which is to assure the agency the "social credit" needed for further fund-raising activity. An analogy with military inspections, close order drill, and parades seems hardly far-fetched.

To forestall a crisis, there may also be a hoarding and husbanding of resources in anticipation of future contingencies that never materialize. This sometimes keeps supplies and personnel from being committed where most needed. The greater likelihood, however, is for an over-reaction out of the feeling that the crisis point has been reached. In cases of threatened civil disorder, the

temptation to take pre-emptive action is hard to resist. Here attempts to avoid a crisis have sometimes precipitated a greater crisis, as for example, when operators in the Glen Echo Park closed down their amusements, fearing their facilities would be overtaxed, resulting in riotous behavior and considerable property losses.

CHOICE

Emergencies are by nature choice situations because they require quick decisions among alternative courses of action before their full implications can be assessed. This type of choice situation gives rise to internalized conflict, the intensity of which has situational and sociological determinants. Thus, internalized conflict will be more intense where the situation contains no clear guidelines for making a choice or where conflicting group affiliations contain sets of obligations that are incompatible with one another. Most routine situations contain little choice. There is an accepted preference ordering of the various alternatives with regard to their desirability and potentially conflicting oblig lons are successfully compartmentalized in time and space. Thus relatively few. dilemmas arise in the normal course of events.

The origin and nature of such internalized conflict during a disaster has been fully detailed by Killian, and we can do no better than take his inventory as a guide, adding some categories of our own.

Perhaps the most far-reaching source of such conflicts are primary group obligations whose demands compete with those stemming from membership in a secondary group. Primary group membership imposes obligations of a pervasive character and extends to all areas of activity. The obligations attached to membership in secondary groups are most impersonal and, therefore, do not have this pervasive character. Consequently, many persons who participate in emergency operations as members of a secondary group, if not reassured about their families, experience considerable conflict over the primacy of their obligation that lowers their effectiveness as participants in rescue operations.

A second type of conflict is between action based on personal knowledge of what is most needed and directives from higher quarters. The limits of discretion are not easily established in advance. On the one hand, a person responsible for local operations is in a better position to assere its requirements than his officially designated superior far removed from the scene; on the other hand, the tendency to exaggerate the needs of the local situation is irresistible for those too closely involved and thus unable to maintain their perspective.

Another source of potential conflict involves the short-term requirements of the immediate situation versus more long-range social objectives. Such conflict is certainly not unique in emergency operations, but the sense of urgency in extraordinary circumstances tends to shorten time perspectives. There may be impatience about the slowness of officials to adopt certain steps out of a concern

for the legal implications or the fear of setting precedents. Action to
restore public order and prevent damage has to consider the lasting residue of
hostility that any excessive use of force, no matter how justified, can leave
among its victims.

The relaxation of institutional patterns creates conflict between primary values
oriented toward people's life, health, and general well-being and secondary
values oriented toward property, status, legality, and so forth. When primary
values are endangered, secondary values lose some of their salience. Yet, con-
flict arises even as to whether people should be urged to abandon their homes
and seek personal safety or whether they should be encouraged to participate in
the effort to preserve them from a fire or flood, even at some personal risk.
The violation of property rights to decrease the suffering of victims is still
another version of this conflict. The employees of a concern may be compelled
to resolve conflict between their loyalties to the "company" and their obliga-
tions to "fellow workers."

Another source of conflict between identification with the community and iden-
tification with some partisan or extra-community group may be seen also as
conflict between the goal of maintaining and restoring order versus the goal
of pressing some partisan claim. Killian invokes the example of the telephone
workers who temporarily called off their strike. When union leaders declared
the emergency over, they came in for considerable criticism from local townsmen
as a result of which many union members resigned. Parallel conflicts occur
between partisan leaders who seek to use civil disorder to press their claims
but who come under criticism, irrespective of the intrinsic merits or justice
behind these demands.

A final form of conflict exists between the alternatives of playing a heroic
role that gains a certain amount of glory or of continuing to pursue what is a
mundane but nevertheless essential occupational role. The problem of appropriate
role models for emergencies has already been discussed.

No amount of advance planning can eliminate all these internal conflicts. How-
ever, the clarification of priorities among competing demands together with an
assurance that vital needs, such as the safety of family members, are provided
for (or will be provided for) can probably reduce disorganization due to such
conflicts. The important point is that goals not officially recognized in
emergency operations at least receive consideration as elements that may
influence the success of any plan.

COMPETITION

Competition is here treated as an ecological form of conflict among populations
for scarce resources and for survival. It involves conflict en masse. A reward
structure in which the gain for any person must necessarily be at the expense of
another favors an individual rather than a cooperative response to the problem.

In the competitive situation, the problem for the individual is simply one of
finding the most rewarding among available alternatives. But on the level of
mass behavior, the problem becomes how to maintain a reward structure in which
the undesirable consequences implicit in a convergence of individual choices
can be kept from foreclosing alternatives, the availability of which would
increase the gain for all.

The most common manifestations of ecological conflict can be traced to com-
petition. Its implications are greatest where the convergence so produced has
cumulative effects. Thus, physical convergence creates bottlenecks that
interfere with escape and rescue operations. During World War II, civilians
fleeing before the German advance deprived the French of roads they needed to
bring up reinforcements with which to stop the invader and gain time to fore-
stall the apparently inexorable military collapse. Similarly, the behavioral
convergence of choices on an object is capable of creating serious shortages,
the very thing against which scare buying and hoarding by individuals is meant
to protect. When the Russians in 1948 in sealing off West Berlin also cut off
its major water supply, fears of shortages led to an overuse of water by people
who filled their tubs in the eventuality that the faucets might dry up. The
precariousness of the water supply notwithstanding, Berliners were officially
encouraged to continue to use water just as they had before, and as the water
kept on flowing consumption returned to normal levels just before the reserves
were depleted. In this instance, the emergency was overcome by imaginative
action. A reward structure favoring an individual solution was prevented from
becoming competitive.

Convergence is always a possibility as long as persons have the capacity to move
and to act. Nor would it necessarily be desirable to eliminate it altogether.
The focalization of activities and of attention on an area where an emergency
has arisen encourages the concentration of resources and services. While much
has been written on sightseers and looters, who add to the difficulty, the con-
vergence of the news media to the scene of nearly any emergency lends encourage-
ment to local efforts. The glare of publicity also holds promise that any
glaring violation of norms or any failure in emergency operations will immedi-
ately be exposed. Ample on-the-spot news coverage by the electronic media like-
wise relieves somewhat telephone circuits that might otherwise be overloaded with
callers who seek information. Some undesirable side-effects of such coverage
have already been mentioned.

A plan to prevent convergence during an emergency has as much chance of success
as a plan to stop the morning rush hour from materializing. Steps can only be
taken to minimize its potentially harmful effects by channeling movement, rather
than blocking it, by providing assurances that certain kinds of nonroutine
actions are unnecessary, and by dramatizing positive examples set by public
leaders and others. The point is to seek control at critical points—for ex-
ample, rounding up of gangs, agitators, and disorganized elements prove to take

advantage of a confused situation—in order to set a proper tone and prevent changes in the collective definition of the situation.

CONFLICT

By conflict we mean those open expressions of antagonism between organizations or individuals who act as the representatives of organized groups. Certainly the element of conflict, when present, contributes to the unpredictability of responses. Conflict has its own dynamic. Latent distrust and prejudice, when they erupt into active enmity, can create an emergency and the escalation of fear, hostility, and suspicions in the course of conflict. These magnify the original cause of dispute so that both <u>violence</u> and <u>treachery</u> come to be condoned, and serious efforts at negotiation can only follow after an open test of strength.

Where violent conflict itself is the cause for the emergency, as in instances of large-scale rioting, participants in operations to restore order almost inevitably become a party to the conflict and are not simply the guardians of law and order. Police operating as rescue units or firemen in the act of extinguishing a fire have found themselves objects of mass hostility. (According to news reports, attacks on fire equipment are a rather recent arrival on the American scene, but they have long been favorite targets of riotous crowds composed of the most abjectly poor inhabitants of the larger cities of the Orient). When parties seeking to reestablish order do not move in quickly and with clearly superior force, their very presence can contribute to the kind of reactive interaction that culminates in an escalation of animosity.

Civil disobedience and public disorder are the likely means of conflict when effective channels for the airing of grievances are unavailable, whether from inability to articulate one's demands or because the dominant party is unwilling to enter into serious negotiations. It does not follow, however, that meetings during the heat of conflict always operate as a safety valve to cool off tempers. Such meetings have often misfired, because inflammatory remarks before a susceptible audience can further stir up hostility.

Emergency operations may involve a variety of conflicts such as between the several organizations already in existence, between an ad hoc committee especially formed for the emergency and some well-established organization, or between several individuals or groups who are competing for leadership. Conflict may also erupt between different segments of the population whose members believe themselves subject to differential treatment. The intensity of such conflicts is often exaggerated, and they manifest themselves chiefly after the peak of the emergency has passed and assessments of performance are made in terms of praise and blame. Their effect during actual emergency operations themselves seems largely a matter of less than full cooperation.

A prime consideration in moderating the inevitable conflicts that do occur is

the maintenance of contact with already established leaders of organizations
and at the grass roots to assure that the intent of any measure is thoroughly
understood. The point to recognize is that an emergency outfit whose activities
are not fully acceptable to the population they are meant to serve is never
fully immune from attack. However, the potentially positive role of leadership
in preventing animosity from escalating into conflict, containing its spread if
it should erupt, and bringing it to a halt needs a more careful consideration
than it has so far reached.

SUMMARY

The preceding has briefly dealt with some elements in problematic situations as
they relate to emergency operations. Each one of these elements contributes to
the kind of problem-solving pattern that emerges. The element of novelty refers
essentially to the unprecedented aspects in every emergency. If they are minor,
reactions to the emergency take on many of the characteristics of a routine
operation. In contrast to novelty, which may or may not be present, attrition
and crisis have reference to the extreme nature of the requirements. Some dis-
tinction between attrition effects, which have a cumulative effect over time,
and the nature of a crisis, which is the point of proximate breakdown, is neces-
sary to explain why after a crisis has been successfully weathered a lowering
of efficiency may nevertheless set in.

Choice, competition, and conflict are elements in the interaction rather than of
the events to which emergency operations must respond. The different levels at
which conflict occurs—internal conflict, ecological conflict, and conflict
among organized groups—permit us to deal conceptually under a single rubric
with the consequences of any strategy followed in planning.

Finally, this analysis of emergency responses draws our attention to the limi-
tations of any specific strategy for coping with extraordinary circumstances.
The nature of these events defies the imposition of any prior structure. Hence,
all planning must be flexible and contingent with planners and participants kept
aware of the emergent elements in response to the situation. A useful differ-
entiation between specific contingencies that can be anticipated and general
possibilities for which those in charge of emergency activities should be on
the look-out seems essential. Above all, thinking about emergencies must not
be allowed to deteriorate into doctrinal reassertions of procedures that are
likely to contribute more to an anticipatory sense of security than to effective
innovation when confronted by the press of events.

II.   OBSERVATIONS ON EMERGENCY OPERATIONS IN A CIVIL DISORDER
Marvin Adelson*

Professor Lang has just talked about civil disorders generally. Since I am
going to be talking about a specific one, I would expect much of what he said
to be reiterated and particularized in my remarks. I want to indicate that I
am by no means an authority on civil disorders. My experience has been limited
to a fairly deep connection with the investigation by the Governor's Commission
of the Los Angeles riots of August 1965. What I have to say is therefore
questionable as generalization. My assertions are hypotheses rather than con-
clusions.

The following figures may help provide some perspective on how extensive and
destructive a civil disorder can be. The disorder lasted about a week and
covered an area (the curfew area) of 46.5 miles, in which 576,000 people live.
It is conservatively estimated that 10,000 people participated in the riots,
and it took 934 Los Angeles Police officers, 719 Sheriff's deputies, and
13,900 National Guardsmen to control the disorder   Thirty-four people were
killed, over 1,000 injured. Property damage approximated $40,000,000; 977
buildings were damaged, looted, burned, or destroyed. Reconstruction has been
slow.

The Los Angeles riots are still being investigated by many people in many
places. The last word, if there ever will be one, has certainly not been said.
My purpose is not to be definitive, but provocative; to stimulate a dialogue
which, though terribly vital, seems to me so far to have gone haltingly. I
am reminded of a story that Sir Geoffrey Vickers tells about a man who jumps
off the top of the Empire State Building. As he passed each floor, he made a
brief report: "Everything's fine so far." We leave him at the second story.
We need not feel complacent because we have survived to date.

We don't really know enough about controlling civil disorders. And if we are
to believe some of the predictions Mr. Momboisse made yesterday, we'd better
do something about that quickly. The best thing to do is to ameliorate condi-
tions that produce such disorders; but if they occur nevertheless, to know how
to handle them. This meeting, and this paper, are devoted to the latter prob-
lem, but the close connection between the two must not be overlooked.

I have made a few observations, based on my study of the Los Angeles riots, in
which you may be interested. One observation is that there was a terrific
emphasis on action, and a corresponding de-emphasis on appreciation or diagnosis
of what was going on. If all riots are basically the same, this observation is

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not so important. But if they differ, nothing could be more important, for without an idea of the dynamics of the situation, opportunities can be missed and difficulties amplified inadvertently. What diagnosis did occur appears to have concerned the <u>size</u> of the disorder, but that is only one dimension. Riot historians have made some important distinctions, but for operational purposes even more detailed differences may have to be drawn and new kinds of action contemplated.

Partly, no doubt, because of the need for speedy response, there has been a tendency to identify "a riot" as a particular kind of event, and therefore to trot out "the riot control procedure" when one occurs. The police riot procedure in Los Angeles was derived from experience in other cities and was based on periphery control. It failed completely. It is instructive, reading the minute-by-minute chronology of the riots, to note how many times the officers were   ordered to stay outside the periphery because of lawless behavior (sic!) inside the periphery.

Thus, there is some presumptive evidence that there may be more kinds of riot than one. Clearly, some models are needed for thinking about the various kinds of riot. The development of useful models is a major research need. I am an amateur at this, but it occurs to me that one might usefully distinguish at least three kinds of riot. One consists of a defined <u>group of individuals</u> rioting. Perimeter control should be successful whenever such a group can be contained. A second kind of riot may be a set of <u>disruptive activities</u> which are spreading across a population or across a geographic area. In that case, perimeter control may not be effective because the set of activities can easily be transmitted across boundaries by gangs, or by individuals who observe them and carry them forward. In this case, fragmentation through the use of sweeping tactics, such as were eventually effective in the Los Angeles case, seems to be promising. A third kind of riot consists of a <u>state of mind</u> erupting into different kinds of activities among people in different areas. And in that case, perimeter control and fragmentation both may be somewhat ineffective, and something which I will call inter-penetration may be required, that is, some set of activities not entirely directed to stopping the violence itself, but to changing perceptions, the way of thinking, the state of mind. Since this may take time and preparation, it becomes relevant mainly when the underlying problem is deep and enduring.

The Los Angeles case probably involved all three of these phenomena. But there was no way at the time to make that kind of analysis operationally meaningful, because there was no locus of responsibility and capability for entertaining that kind of consideration.

A general observation, aside from the fact that there may be several distinguishable kinds of riots, is that--and this would be trivial except that it does not appear to have been acted upon--riots very likely go through identifiable phases. There appears to be a <u>start-up phase</u> following a catalyzing incident; a <u>venting phase</u>, whose ferocity is independent of the character of the incident; an

opportunistic phase in which people start to use the disorder, either casually, as in the case of individual looting, or systematically, as in the case of organized looting or political agitation; and the end game, during which the disruption is brought to a close. Without going very deeply into these phases, it seems to me very likely that the control tactics that are appropriate in one phase may be ineffective at best, disastrous at worst, if used in another phase. For example, arrests on a large scale were not used as a control measure until relatively late in the Los Angeles riots. This may explain why there were only seven arrests for arson out of some 4,000 total arrests, although property damage due to arson ran into the millions of dollars. In any case, in planning for "riot control," one should look fairly carefully at what the underlying dynamics are, and develop contingency plans accordingly.

The next observation is slightly different. There appears to be a serious communications problem among the agencies of government involved in emergency operations. The difficulty of maintaining adequate communications under emergency conditions is well recognized in military command-control systems, where it has received a great deal of design attention. The corresponding problem in emergency operations is known, but it has received much less design attention. Of course, to note that there is a communication problem in civil emergency operations is easy. To analyze the problem and see what steps are needed to resolve it, is not so easy. To make a start in that direction, at least four major communications problems encountered in the Los Angeles riots should be mentioned.

1) The first was up the chain of command: it was very difficult to convey an adequate idea of what was happening to, for example, Sacramento, where we were told yesterday by the Deputy Attorney General, at least some officials did not believe what they were being told. There is some evidence that the disbelief, if it really was general, was based on more than "communications problems" in the technical sense. It was based in part on prior relationships between officials at the local level and officials at the state level. That is doubtlessly a real and general consideration, and needs to be dealt with in trying to get critical messages through under emergency conditions. But there are other kinds of information, pertaining to potential negotiations, to resource availability, to special problems and opportunities, which should get through promptly, and which appear not to.

2) Secondly, there was difficulty in communications among operating units; the National Guard is officially on record as saying it had difficulty communicating.

3) Thirdly, there was a communication problem among kinds of units: the National Guard, police, fire units and so on. This is not a new problem. In the 1961 Bel Air fire emergency the police departments in various jurisdictions, and the police vis a vis fire departments, found that they could not communicate adequately because they had different kinds of radios tuned to different frequencies, as well as different procedures.

4) Finally, there was a communication problem between the "power structure" (if you'll allow me the use of that term) and the "community" that was erupting. Attempts at communication were repeatedly made--at least in one direction and they repeatedly failed.

The next observation: There is a tendency to identify riots with police action so that in a riot situation the police are implicitly thought to be in charge. For example, when the County Human Relations Council wanted to suggest ways for containing the riot, they went to the police department. Now, it is clear that the prerogatives open to the police, and the class of responsibility it has, may prevent its seriously considering that kind of suggestion, or even taking kindly to the attempt. The leadership vacuum which has been attributed to the curfew area residents is matched, for the, in the government structure: there is no place to which people know they can go to get a government leader to respond to or even accept inputs during a crisis situation. The need for local government to provide for such inputs has not been generally recognized! Probably the single characteristic that makes civil disturbances different from hurricanes, nuclear bombings, and other kinds of disasters, is the opportunity to negotiate, which does not exist under those other circumstances. That opportunity was not planned for and, as far as I can determine, was not much utilized in the Los Angeles situation. Negotiation might have been very useful indeed. Yet there was no clear instrumentality for doing it, and there will not be next time unless prompt steps are taken. "Can the police control the situation or shall we call the National Guard?" should not be the highest order of decision attempted. Means should be found to amplify available resources of government by using the private community and its resources effectively and imaginatively. The police are not likely to do it. A locus of responsibility for it must be established. How this is to be done is a complex matter and must be studied carefully. The way in which subsequent flareups in Los Angeles that threatened a repetition of what happened last August were controlled by community pressure shows the potency of community cooperation in controlling violence. Perhaps a symposium on "emergency co-operations" would be useful to focus attention on this problem.

The next point is that riot control by prevention is obviously desirable and may be possible. An "early warning" system that develops indicators of problems which may lead to trouble, based on the collection in a systematic and regular way of relevant information and data, should be helpful, provided there is a locus of responsibility for using this information and for providing indications at a high level (for example, at the level of the mayor's office in a given city) of what conditions--psychological as well as physical-- are really like. Presumably, a similar arrangement would be desirable at the state level, because resources beyond those available within the municipality may be called for. Prevention is by far the most attractive course, but it may be very expensive. People have to be willing to pay the price. The value of preventive action has become a little clearer recently, so perhaps chances have improved.

Some potentially valuable steps need not be unduly costly. A place, such as that described in the preceding paragraph, to which people could go to air their grievances, with some assurance that positive action might ensue, could be very helpful in (a) providing advance notice of impending problems, (b) developing an ongoing capability to "interface" between formal government and the people, and (c) preventing the pressure buildups that result in riots, by providing more regular channels for the redress of ills.

A theme that has recurred through these meetings has been that preparedness through planning is possible, but it can only be depended upon up to a point. Professor Lang has just indicated that preplanning invokes, or implies, some rigidity and therefore interferes with needed flexibility. Consequently, it seems to me appropriate to moderate the notion of planning as related to civil disorders, and to augment the preparation of explicit plans with the generation of what I call vicarious experience for the people who have or will have responsible roles. This can be done through such techniques as exercising, gaming, and role playing, and the study of strategy, tactics, and the history of related matters in other places. But, to be at all effective, this sort of thing has to happen not only at the operational level, but at command levels, and at political decision levels as well. That is, people all the way up and down the chain of command must be involved seriously and regularly in this sort of enterprise. I think that it is fair to say that preparations at the level of police department, at the level of the sheriff's office, the fire department, and so on, have gone very far beyond corresponding preparations at higher levels, and that some match needs to be made. And of course preparations at all levels have to be improved. But the point is that responsible people, individually and in teams, have to be prepared--rigid procedures won't do.

The next observation is that the information one would like to have had about the Los Angeles riots was largely unavailable or very difficult to get, and that our understanding of riots ultimately will depend upon how much relevant information we can gather and interpret whenever and wherever such outbreaks occur. This suggests that the nation's cities, where riots are most likely to happen, should be "instrumented," that is, that preparations be made in advance to gather data whenever riots occur. This means prior study of what variables should be observed, and the making of arrangements so that they can be observed, recorded, and compared with corresponding data gathered elsewhere.

Finally, it seems to me that the problem that we're discussing certainly transcends the interests and the capabilities of the individual cities. It was suggested yesterday that this summer may be a long and a hot one, with eruptions in various cities synchronized and organized at a higher level. Whether that prediction is right or wrong, it seems that from the point of view of the national well-being, preparations need to be made, in part at least, at the national level to handle situations of that kind. Consequently, it is not unthinkable that federal support be given to relevant programs of the kind I have alluded to, provided that rational, sensible, workable proposals can be generated in time.

Now let me briefly summarize my conclusions. Diagnosis is vital; a trigger action response is probably a bad thing in some substantial proportion of cases. And there should be somebody, other than the police, whose job it is to make the diagnosis. Analysis by phases is vital to permit choice of action alternatives to correspond to the phase of the disturbance. Both diagnosis and analysis require relevant and useful models that are meaningful to the people with the operational responsibilities, and data that have been carefully gathered, and that is a large research order. Community resources may be helpful if well used, or if misused, positively harmful. Their appropriate use requires high-level decision making. Prior exercises and planning-related preparations must involve supra-operational (supra-police, supra-fire department) elements in an active and continuing way, but police, fire, and related agencies should fill appropriate roles in the process. The leadership gap at high levels must be filled. Riot control by prevention is desirable and may be possible; it would be facilitated by bringing into existence an early warning system, associated data banks, the development of indicators, and the establishment of loci of responsibility. Riot control by negotiation may be useful, but arrangements for negotiating must be made in advance. These arrangements could also be used to let off steam before violence erupts, and thereby contribute to prevention. And finally, the problem transcends individual cities, and federal support is appropriate.

1lI.   DISASTER MEDICAL CARE
Francis C. Jackson, M.D.*

Since 1900 the practice of Disaster Medicine has been characterized by confu-
sion, lack of communications, delay in emergency treatment, and no recognizable
improvement in survivor morbidity. While some misadventure will attend every
community emergency, many of the problems relative to medical care can be ob-
viated by augmenting regular emergency medical services, instituting approved
practices for disaster medicine, and providing certain key supporting services
already available from the community.

Emergency medical care is usually considered in the context of injury or trauma
and some data indicating the magnitude of this problem is available. While the
total number of American deaths from injuries in natural disasters is unknown,
at least 1,000 citizens have died and 5,000 have been injured in these catas-
trophes during every year of the current century.[7]** In addition, naturally-
occurring accidents are now producing annually over 105,000 deaths and 10,500,000
injuries. The rapid expansion of urban living, the development of large indus-
trial complexes, the continuing growth of population and expansion of rapid
transportation facilities will pose an even more serious threat of mass injury
in the future.

RESPONSIBILITY FOR EMERGENCY MEDICAL SERVICES

Medical services by their very nature revolve around a hospital. Any planning
or organization for total community emergencies must, therefore, utilize the
hospitals as the functioning agency during the planning and operational phases
in preparation for the ultimate stress of naturally occurring disasters. Such
medical services, however, cannot be placed within the province of health de-
partments, since in the daily operation of these agencies the Health Officer
does not function in an echelon fashion with the Hospital Administrator, the
local hospital association, or the component medical society. It is difficult
to support the concept (as recommended by the Division of Health Mobilization
of the U. S. Public Health Service[1]), (see Figure 1), that medical care is a
function of Emergency Health Services in disasters. Since it is exceedingly
doubtful that such health departments will assume direct leadership of a ser-
vice in any disaster, it is strongly recommended that such Emergency Medical
Services should be considered as a separate community function operating under

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 Professor of Surgery, University of Pittsburgh, School of Medicine.

**References appear at the end of this paper.
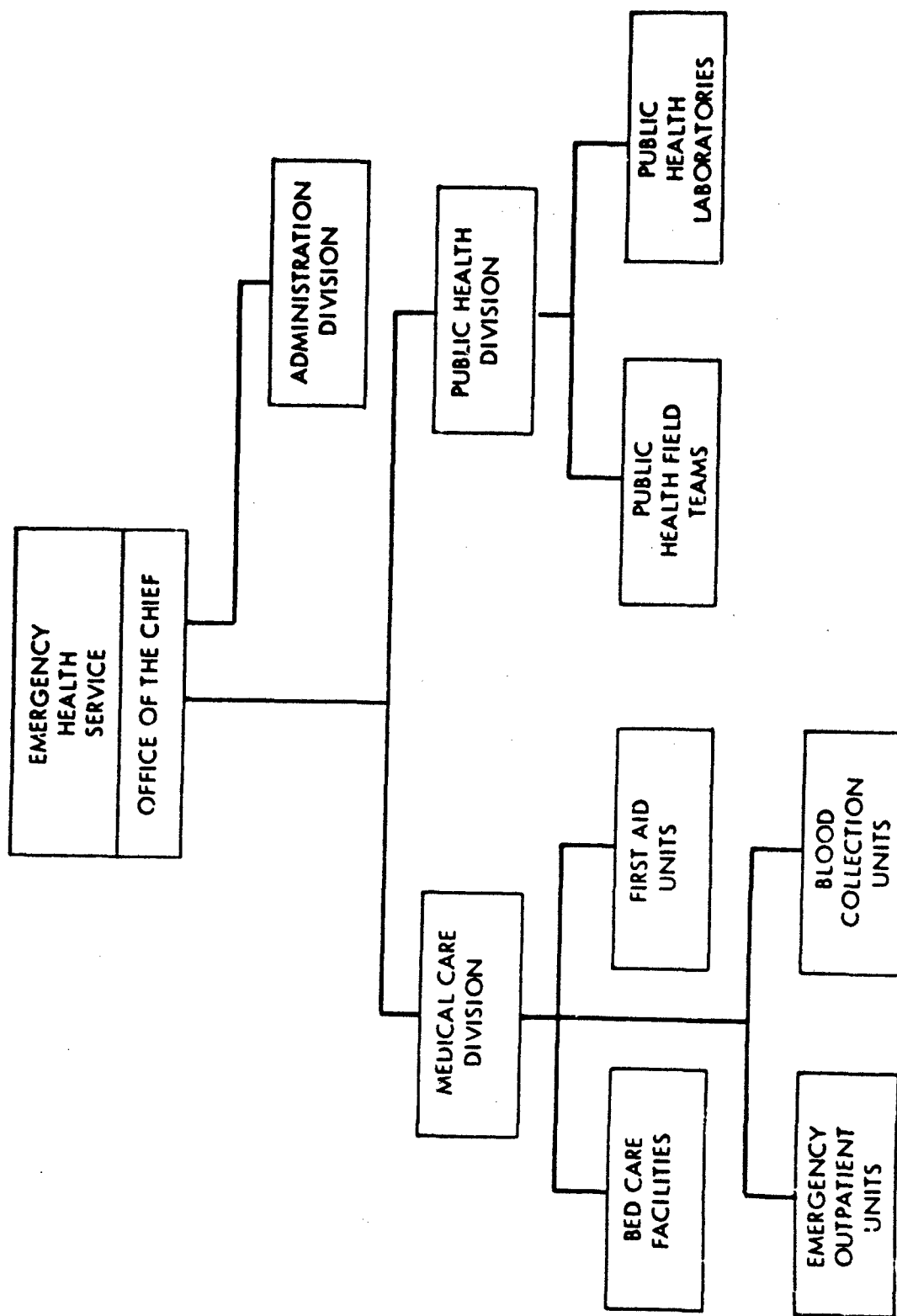
BASIC ORGANIZATION: COMMUNITY EMERGENCY HEALTH SERVICE

Figure 1.

a Disaster Command or Authority which is established within the community table of organization. This may be the Mayor, Chief of Police, or Office of Civil Defense.

Emergency Medical Services can best be established by the local hospital association or the state or component medical societies. The leadership of a physician (Chairman of the Disaster Committee of the Medical Society) or a hospital administrator (Chairman of the Disaster Committee of the Hospital Association) should be sought to direct the development of such disaster plans.

The role of the physician in this function has been carefully outlined by the American Medical Association.[2] However, it should be emphasized that Emergency Medical Services must be coordinated with all emergency services in order to function effectively at a disaster site or at the center of the community emergency complex itself (i.e., the Disaster Headquarters).

PHASES OF EMERGENCY MEDICAL SERVICES

There are basically three major phases (Figure 2) of Emergency Medical Services: (1) the disaster site phase; (2) the hospital phase; and (3) the convalescent or recovery phase. Each of these periods requires varying degrees of support from community agencies other than the hospitals; i.e., through governmental and voluntary agencies. The importance of these supporting services will become more apparent in the discussion of the practice of disaster medicine itself.

The Disaster Site Phase, or Phase I

In order to provide medical or first aid services at the disaster site, it is of vital importance that leadership, personnel, and certain materiel be dispatched as soon as possible after the extent of human involvement in the disaster has been determined. The medical authority should be a physician or a member of one of the allied health professions. Such authority in New York City is now provided by a hospital administrator who directs a first aid station on the scene of the emergency.[4, 5, 6] (New York City assigns a Hospital Commissioner as the Disaster Medical Authority at the first aid station near the scene of a major disaster. Other stations are indicated in the suggested layout depicted in the Operations Manual for Disasters.)[4] There is no question that a physician with experience in military medicine or trauma is the ideal medical authority for the disaster site. When such authority is provided, its usefulness will depend entirely upon how it is permitted to operate by the police or fire officials. In at least one city physicians are attending any emergency where police request such assistance.[3]

SURVIVAL ROUTE

PHASE I   PHASE II   PHASE III

DISASTER SITE
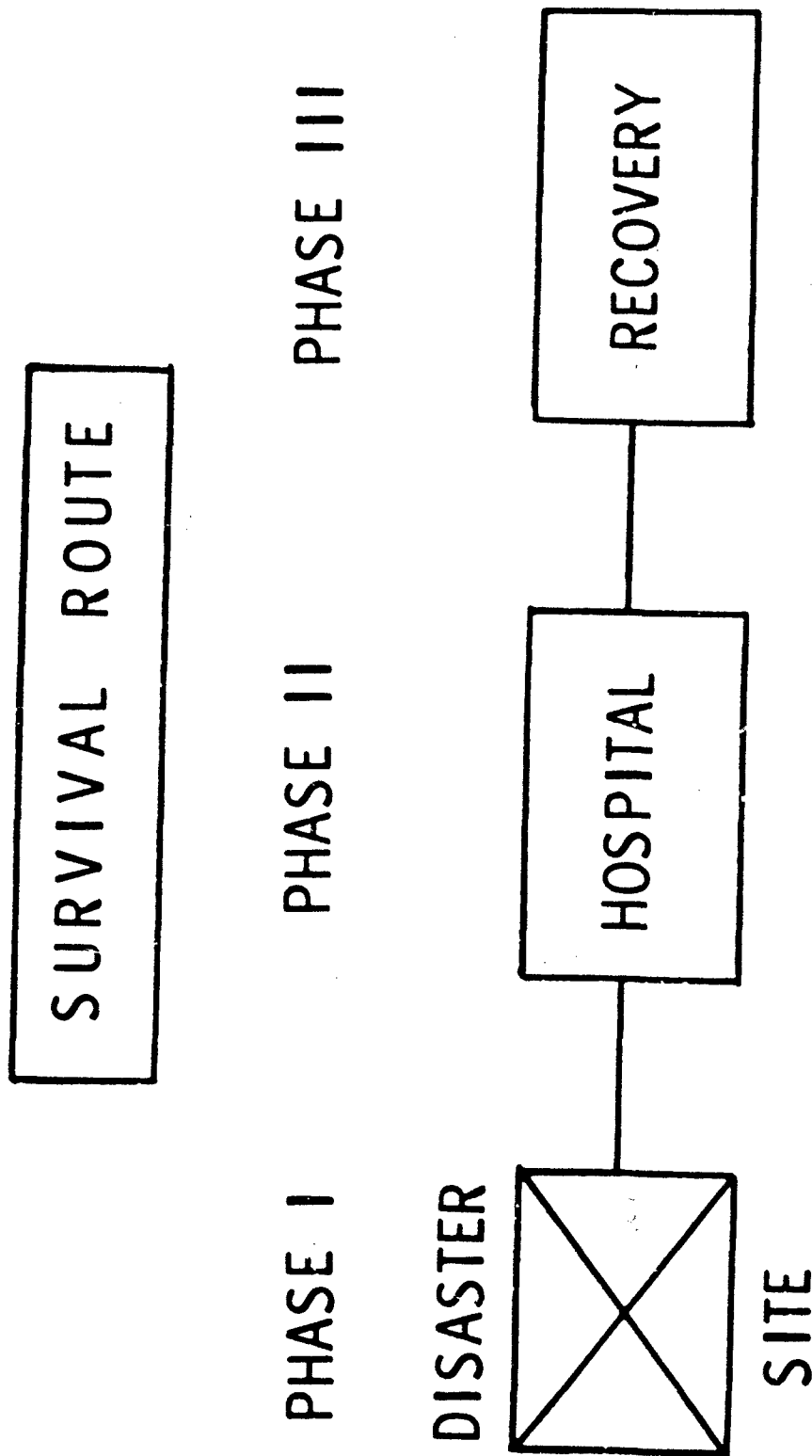
HOSPITAL

RECOVERY

Figure 2.

The supporting services at and from the disaster site to the hospital are
peculiarly important in terms of effective and appropriate emergency medical
care, since this area of the survivor's route to recovery is largely uncon-
trolled by the hospital organization or the physician. These supporting
services are Medical Communications, Security and Traffic Control, and Trans-
portation (see Figures 3 and 4).

Experience during most, if not all, disasters indicates that the hospitals are
rarely notified of the existence of the catastrophe. The failure to notify
hospitals in any emergency is a common practice probably because of a miscon-
ception that the sooner the injured victim arrives at the emergency room the
more his chances of survival are enhanced. This is not always true! It has
been suggested that in many instances the DOA (the patient who is "dead on
arrival") did not survive his acute injury or disease because he did not re-
ceive proper emergency care before the rush to the hospital.

The safe transportation of the injured has been the subject of much discussion.
Most authorities are now agreed that the speeding ambulance is not an essential
element in the preservation of life.[8] During a major disaster, the large volume
of patients descending upon any medical facility as the result of such well-
meaning efforts to get them to the hospital produces such a serious burden on
the medical facilities that, whatever the presumed advantage of rapid transport,
it is quickly lost in the ensuing delay and confusion of medical care.

Any organization designed to produce the most satisfactory salvage of survivors
requires organization and only a medical authority at the disaster site can
provide this essential. Therefore, what would be his duties?

The essence of disaster medicine is the establishment of priority in emergency
care. Such a process is referred to as sorting or triage. This is a continu-
ing procedure which must be instituted at every stage of the survivor's pro-
gress beginning at the time of injury and extending to the period of final or
definitive care for his injury.

The medical authority at a disaster site must be implemented or coordinated
with other emergency resources, especially if a command headquarters is part
of the community organization. The medical authority at such a central con-
trol would coordinate the activities and medical needs of the disaster site
with the hospitals and other emergency elements. In natural disasters, the
central medical authority or coordinator could be located in the Office of
the County Medical Society or one of the community hospitals where radio com-
munications permit such centralization of medical services. (The organization
of disaster medical services in Travis County (Texas) places a medical head-
quarters at one of the five hospitals in the area. Physicians are assigned
to key positions in the organizational plan.)

SURVIVAL ROUTE

I

RESCUE
MEDICAL AUTHORITY
EMERGENCY MEDICAL CARE
SORTING

II

HOSPITAL

HOSPITAL

HOSPITAL

COMMAND
COMMUNICATIONS
SECURITY
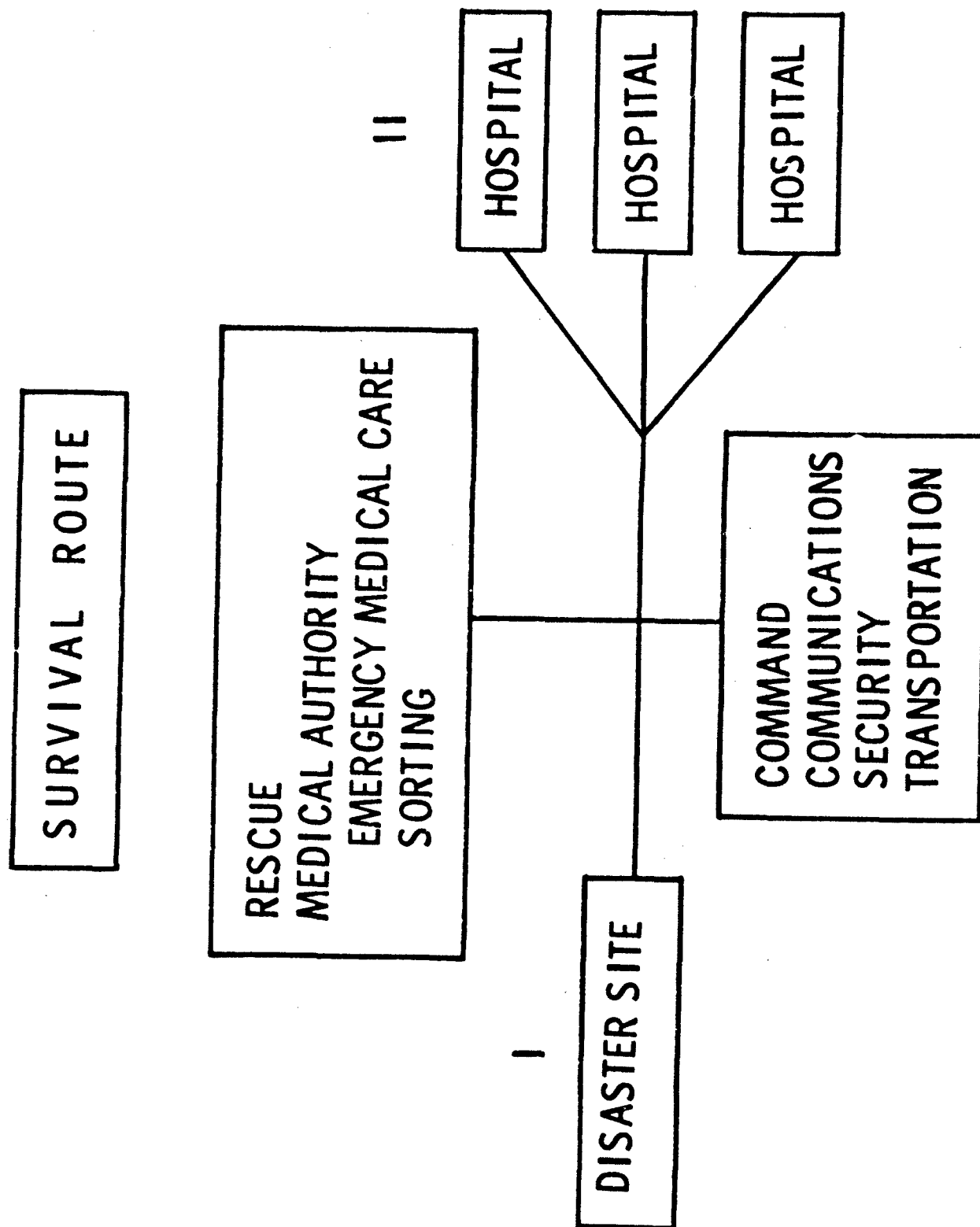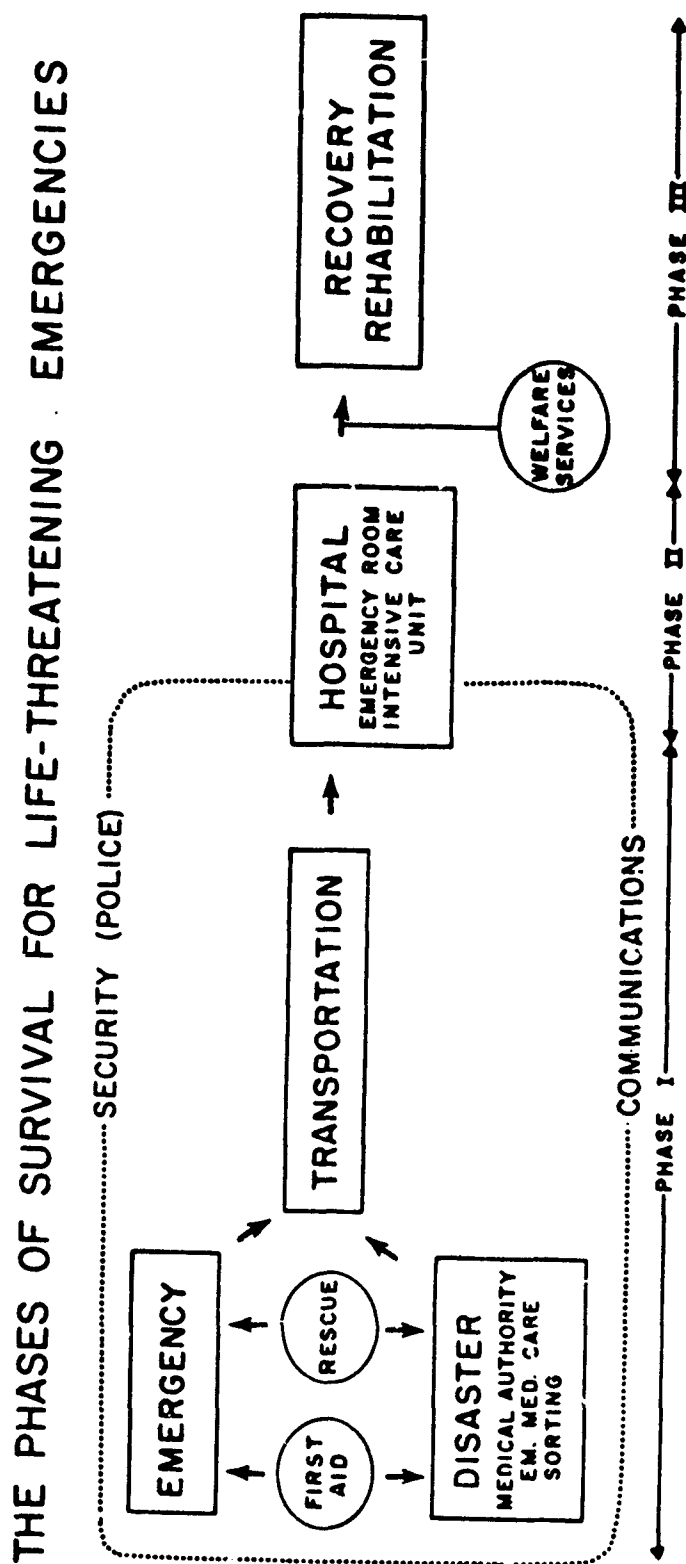TRANSPORTATION

DISASTER SITE

Figure 3.

Figure 4.

It is quite obvious that the medical requirements at the disaster site go beyond the establishment of a recognized medical authority. First aid and certain aspects of rescue would be under his supervision in order to permit the Phase I of disaster medical care to operate with continuity. All survivors should receive certain basic emergency treatment before being sorted and distributed to the hospitals. In effect, this means that hemorrhage would be controlled, fractures splinted, and a majority of wounds covered by suitable dressings. Of even greater importance would be the establishment of airways and some treatment for hypovolemic shock (i.e., salt lutions or plasma expanders). Prevention of further injury is of particular concern during rescue and transportation.

The process of sorting requires a professional capability of both <u>diagnosis</u> and <u>prognosis</u>. It also requires a knowledge of the medical resources of the hospitals (i.e., availability of a neurosurgeon). Immediate life-threatening conditions do not necessarily occur in those survivors who may appear to be extensively injured, yet, it is the physician's responsibility to select his patients for transfer <u>on the former basis only</u>. With a large number of injured, it should no longer be acceptable to turn this responsibility over to police or firemen, or even ambulance attendants.

In addition to sorting and supervising rescue and first aid, the medical authority should immediately establish and maintain medical communications contact with the hospital system; preferably through a medical control center. While a nonprofessional system could be utilized, the need for a separate medical network has the added advantage of accurate exchange of medical information.

The need for security and traffic control is the second major supporting service necessary for effective medical action. The establishment of a protected area or stations, an ambulance pool, and a primary sorting point require absolute isolation from crowds and other disaster activity. Free ambulance access and prompt dispatching over streets with controlled accesses have also been developed in the New York City Plan.[4] (This Operations Manual for Disasters developed for the New York City Police Department provides for a controlled access to the scene of the catastrophe. This is one of the most important supporting services in the Phase I concept of Emergency Medical Care.)

Ambulances and other vehicles used in transport of the survivors must function at the direction of the medical authority. This distribution of casualties is not a matter of "possession" of a victim but should be based upon a calculated priority of care. Examples of the abuse of transportation services provide astonishing commentaries on the confusion of these disaster services, such as the fire on the aircraft carrier U.S.S. Constellation in Brooklyn in 1961.[5,6]

The Hospital Phase, or Phase II

The hospital phase of Disaster Medical Services is more likely to be a satis-
factory phase than the activities in Phase I. The reason is simple. Hospitals,
since World War II, have been required by the Joint Commission on Accreditation
(American Hospital Association, American Medical Association, American College
of Surgeons, and American College of Physicians) to have a Disaster Plan and to
exercise or test the plan twice each year. Such a requirement is necessary for
accreditation (a system by which hospitals must achieve certain specified stand-
ards--and only slightly over one half of the hospitals in the United States have
achieved such accreditation). To my knowledge, no other comparable association
providing critical services has such a disaster requirement as a part of certi-
fied accreditation. While most hospitals have the plan, the extent to which
they rehearse is not uniform, and in many instances may unfortunately remain
a "paper" program. Nevertheless, most hospitals in urban areas are more con-
scientiously aware of their role in disasters than almost any other voluntary
agency.

To be an effective unit, the hospital must, above all, be alerted to the occur-
rence of a catastrophe. While it is probably unfair or incorrect to say that
hospitals are routinely uninformed--during the twenty-five or more major dis-
asters which occur in this country each year, most studies still conclude that
the majority of these institutions first receive the warning when the casualties
are entering their emergency room! Community authorities have long ignored the
notification of hospitals in such situations possibly on the assumption that
the hospital is always ready for an emergency and that the simple depositing
of survivors in the halls of the institution absolve them of further responsi-
bility.

Unfortunately, the hospital (as any complex service unit) maintains a certain
submaximal capability of inertia which requires time to get into operation.
Disaster medicine is not a single off-shoot of daily medical care but requires
the mobilization of professional people, equipment, and supplies. The role of
the hospital, therefore, is so important that its incorporation into community
disaster plans requires that it, above all agencies, should be immediately
alerted if lives are to be saved in the ensuing confusion of the post-disaster
period.

What is necessary for the hospital to do in these circumstances? The following
is an outline of the functional elements which are triggered following the alert:

1. Key personnel are notified and a disaster control center is made
    operational.

2. Ambulatory and other patients are evacuated to expand treatment
    areas.

3. Communications are established with the disaster site and other hospitals.

4. The emergency room and immediate care facilities are augmented.

5. Internal and external security is established.

6. Internal emergency communications are set up.

7. Treatment wards are consolidated and resupplied.

8. Operating room teams are assigned and include all specialties.

9. An emergency record system is established.

10. An information center for relatives and the Press is established.

11. An emergency morgue and identification system is erected.

12. A volunteer and hospital employee manpower pool is organized.

For the above organization to function with any degree of efficiency it must be tested, retested, and revised on an annual basis. Rehearsals, drills, and even surprise exercises have illustrated that the hospital can be an extremely effective unit in the community's disaster plan. The mechanisms of rehearsing and estimating the effectiveness of hospital drills have been amply recorded,[10] and checklists are available to assist evaluators and planners.[11]

The Convalescent or Recovery Phase, or Phase III

This period, timewise, begins at the completion of definitive care of the survivor or following the "life saving" period of treatment. The end point for such a period would extend to the date at which the individual returns to work or normal physical activity. The supporting agencies of the community would again become important factors in the medical care which evolves at this time, particularly in terms of welfare services. Examples are: the Red Cross, the Department of Welfare, Rehabilitation Clinics, Job Retraining agencies, etc. Essentially, the medical aspects are ended when the maximum physical improvement has been achieved.

DISASTER MEDICINE

A proper question at this point should be the clarification of just what is Disaster Medicine and how does it differ from Emergency Medical Services rendered daily by physicians and hospitals.

The spectrum of injuries following natural disaster differs little (except in terms of numbers) from the routine emergencies of the Hospital Emergency Room. Multiple injuries in individual patients do not necessarily predominate. While there are no accurate statistics to provide a true concept of the distribution of injuries among such survivors, a reasonable estimate of the medical case requirements would be that 40% would need minimal or no treatment; 20% would require immediate or life-saving care; and 40% could have their treatment delayed even though they might require hospitalization and surgery.

The essence of disaster medicine, as I have emphasized, is in sorting the injured in terms of a priority of medical care. This procedure is not necessarily designed to provide priority treatment for the most seriously injured but for priority in terms of immediate care for those who may otherwise die from their injuries. As has been intimated, the military criteria for sorting (see Figure 5) is probably ill-advised and medico-legally unfeasible in natural disasters. Every survivor must be treated in accord with accepted standards of "every day" emergency medical services. A revised table for sorting is recommended (see Figure 6) in natural disasters. This priority system implies that all survivors are treated, and eliminates the "expectant" category.

The determination of priority in emergency medical cases requires that the sorting physician be experienced and capable of not only making a diagnosis of the principal injuries of survivors, but, of even greater importance, to recognize the prognosis of such an injury. Military surgeons with combat experience are still the best sorting officers. Indeed, it is the military management of mass casualties which may be considered the most ideal prototype for planning and management of casualties in all disasters.[8, 16]

Based upon diagnosis and prognosis, the casualties in natural disasters should be assigned to: I. Immediate Care (for treatment of airway obstruction or shock); II. Ambulatory Care (for treatment of small wounds and abrasions); and III. Delayed Care (for treatment of conditions which may safely be postponed for several hours or days, closed fractures, cavitary injuries requiring observation, etc.). There would be no "expectant" category of injuries as might pertain in a thermonuclear disaster where the disproportion between medical resources and requirements would be far more serious and many patients by reason of the known high mortality for their injuries would receive little or no definite treatment.

Not only is initial sorting important, but constant resorting must take place if a medical care is to provide a satisfactory salvage. This requires monitoring of vital physical signs as related to the basic injury. For example, a patient originally sorted to the delayed care area might become immediate care by hemorrhage, airway obstruction, etc. Serious attention must be paid particularly to the basic military practice of wound care. Wounds are thoroughly debrided of foreign bodies and dead tissue, cleansed, and, in general, packed open for later suturing (the so-called method of secondary closure). The possibility of serious infection is greatly lessened by such procedure. It is

SORTING PRIORITIES

I   Minimal Care (ambulatory)

II   Immediate Care (shock - airway)

III   Immediate Care (surgery)

IV   Delayed Care

(v   Expectant Care)

Figure 5.

PRIORITIES FOR NATURAL DISASTERS

I   Immediate Care (Resuscitation)

II   Ambulatory Care

III Delayed Care

Figure 6.

this type of care as practiced by military specialists which has, in part, reduced the World War II mortality from over 6% to 1.2% in South Vietnam. (This mortality is determined after the point at which the wounded man is first attended by a physician).

The vital importance of proper sorting can further be demonstrated by reference to the known consequences of blunt injury to the abdomen (see Figure 7). A knowledge that the prognosis for injury to the spleen carries a 95% chance of death if untreated by surgery, as compared to only 5% when splenectomy is promptly carried out, must be appreciated by the sorting officer who first examines a patient with fractures of the left 10th to 12th rib as the result of a crushing blow. These fractures are most commonly associated with ruptures of the splenic capsule as well as the left kidney.

Of course, Disaster Medical Care is much more complex than the above simplified outline would suggest. The total effect on a survivor by what is referred to as multiple injuries (or multiple systems' diseases) considerably escalates the therapeutic problem. An elderly patient with heart disease and an open fracture of any extremity will obviously require more hours of care from physicians, nurses, and nursing assistants during the first week following injury than a similarly injured patient in his twenties. The victim with an 80% burn on his body surface may only survive his first 24 hours if he receives large amounts of fluids (up to 8 litres) and blood (3 units) or blood products (plasma). The chemical monitoring of his metabolic stress may require a dozen or more blood samples drawn every twelve hours. The number of such casualties does not need to exceed two or three before professional staffing, supplies, and equipment in many hospitals may be seriously taxed. (The average American hospital has approximately 75 beds). Nevertheless, planning and organization can reduce the stress upon any hospital and its staff.

ESTABLISHING MEDICAL CAPABILITIES IN HIGH-RISK AREAS OF THE COMMUNITY

The most serious defects in Disaster Medical Care are currently in the Phase I area.[15] While the development of organizational authority will ultimately correct these deficiencies, it is much more feasible to develop such capability in "high-risk" areas such as airports or industrial plants. The medical departments at many major plants have established excellent emergency organizations. The AMA Council on Industrial Health Emergencies developed a guide for such services in 1961.[12]

A major airport is an ideal area for an organized program for emergencies, since airline catastrophies are daily hazards. In addition, the catastrophies in which there are survivors occur on landing or takeoff. Authorities are quite receptive to medical assistance and yet, surprisingly, no major airport in this country had a medical annex to its regular Disaster Plan in 1961.[13]

"BLUNT ABDOMINAL INJURY*

ORGAN	%MORTALITY
SPLEEN	5-95
LIVER	67
KIDNEY	20
URINARY TRACT	15
PANCREAS	15
INTESTINE	10
MISCELLANEOUS	--

* GRISWOLD, R.A. et al. Surg.Gynec.& Obstet.
309:112, 1961

Figure 7.

At the Greater Pittsburgh Airport a somewhat revolutionary organization was developed in 1962 which included the delivery of nurses and physicians to the field; the availability of prepositioned supplies; and the establishment of an immediate area on the field[14] (see Figure 8).

The Pittsburgh plan is designed to care for 100 survivors. This required considerable attention to the peculiar spectrum of injuries which result from aircraft accidents; such as ventilatory obstruction, burns, fractures, and shock. (See attached Appendix containing the immediate supply table for care of these injuries.) Attention in the plan was also directed toward life-saving procedures at the crash site and immediate care with a primary sorting system in a fire station (the Fire Alert Building). The aim was to provide a safe, orderly triage of survivors to the four participating hospitals.

There have been two rehearsals of this airport's disaster plan, utilizing 100 simulated casualties and two actual alerts--all of which demonstrated that mobilization of these resources is now currently possible. Inventories are checked and rotated monthly by the staff of the County Hospital (John J. Kane Hospital) so that the hardware in the storage area is always in readiness.

Probably one of the most important features of this plan is the communications system which is initiated by an observer on duty 24 hours a day at a special tower in the Fire Alert Building. This individual is in communication with the airport tower, the county police, and the county hospital. In this institution there is another network which includes over 30 volunteer fire companies with rescue squads and four community hospitals. The main highway from the city of Pittsburgh can be controlled by policing the limited access interchanges using the police departments of five boroughs along its 10-mile extent.

The Pittsburgh Airport, therefore, incorporates the concepts of medical authority at the disaster site, emergency care before sorting to hospitals, and a system of controlled distribution without overloading the hospital system. These concepts should provide better emergency care and therefore more survivors of disasters occurring in such a high-risk area.

SUMMARY

Disaster medicine following natural disasters cannot be practiced through the medium of community health departments. It is an augmentation of regular Emergency Medical Services in which the hospital remains as the principal functioning unit. Particular requirements for effective organization include medical authority, communications, traffic control and security, and safe transportation. The basic feature of disaster medical care is a system of sorting according to priorities of emergency medical care--a process which begins at the disaster site and continues through three phases of survival (i.e., disaster site, hospital, and recovery). High-risk areas, such as airports, are sites where effective emergency services can be quickly established by preplanning and rehearsal.

CASUALTY ROUTE

PITTSBURGH AIRPORT
DISASTER PLAN

SEWICKLEY VALLEY HOSPITAL

OHIO VALLEY HOSPITAL

JOHN J. KANE HOSPITAL

MERCY HOSPITAL

FIRE ALERT STATION
(FIRST AID-SORTING)

PHYSICIANS
NURSES
AIRPORT PERSONNEL
STORED SUPPLIES
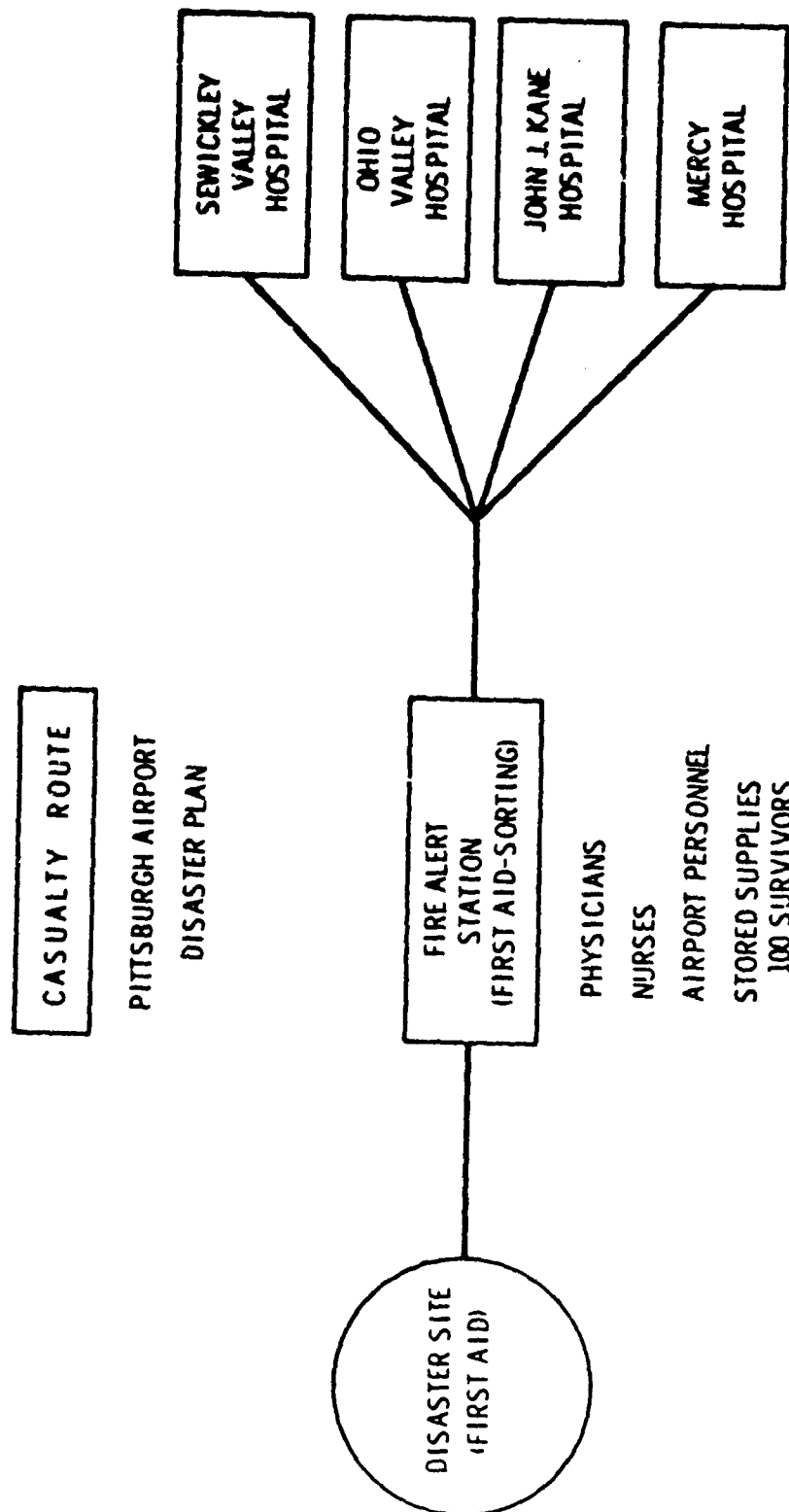100 SURVIVORS

DISASTER SITE
(FIRST AID)

Figure 8.

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APPENDIX A

DISASTER PLAN FOR GREATER PITTSBURGH AIRPORT

Supplies Available at Crash Site on Fire Truck

Dextran 6% - 500 cc. with administration set and needle
Scissors - Lister bandage - $7\frac{1}{2}$"
Tourniquets - IDEAL and rubber
Airways - Resusitubes (child/adult)
      Plastic - pheryngeal - adult/child
      Guedel - rubber
Slings, arm - triangular bandage
Steri-pads - 4" x 4" - gauze sponges - prepackaged sterile
Bandage - roller gauze - 2" - 3"
Adhesive Tape - $1\frac{1}{2}$" - $\frac{1}{2}$" - 3"
Combine dressing pads - 8" x $7\frac{1}{2}$" - not sterile
Profuse Drainage Pack - J-D Pack - sterile
Skin marking pencils - blue
Oval eye pads - $2\frac{1}{2}$" x $2\frac{1}{2}$" - prepackaged sterile
Pencils - black lead
Splints - wire ladder - $3\frac{1}{2}$" x 31"
Wadding - cotton
Pins - safety
Syringers - Disposable - 6cc - 20G x $1\frac{1}{2}$"
                    3cc - 25G x 5/8"
                        20G x 1"
                        20G x $1\frac{1}{2}$"
            Insulin - 25G x 5/8"
Laryngoscope - MacIntosh - size 3 with handle
Endotracheal tubes - sized 14 - 36 - child & adult, with cuff
Adapters for endotracheal tubes
suction catheters - plastic - disposable
Nasal oxygen catheters - plastic - disposable
Oxygen masks - plastic
Knife - handle #3
Knife - blades - sizes 10-11-12-15
Collins tongue holding forceps
Sierra-Sheldon tracheotome
Lyovac Normal Human Plasma - 250cc with administration set
Normal saline solution - 500 cc
Venopaks with needle
Oxygen connecting tubes - plastic
Dressing sets - (sterile) - (hemostat-forcep-scissor)
Pulmonators - 2 each
Adaptic gauze

Kling gauze
Tongue blades
Applicators
Aprons with dressings - tape and scissors
Alcohol sponges - prepackaged sterile
Elastic bandage - 4"
Medical Tags

Supplies Available at Reception Center (Fire Alert Building)

1. Dextran 6% in Saline - 500cc with administration set & needle
2. Scissors - Lister bandage - $7\frac{1}{2}$"
3. Tourniquets - IDEAL
                    Rubber
4. Airways - Resusitubes - child/adult
            Plastic - pharyngeal - adult & child
            Guedel - rubber - adult & child
5. Slings - arm - triangular bandage
6. Steri-pads - 4' x 4' - gauze sponges - prepackaged sterile
7. Bandage - roller gauze - 2" - 3"
8. Adhesive Tape - $\frac{1}{2}$" - $1\frac{1}{2}$" - 3"
9. Combine dressing pads - 8" x $7\frac{1}{2}$" - unsterile
10. Profuse Drainage Pack - J-D Pack - sterile
11. Skin marking pencils - blue
12. Oval eye pads - $2\frac{1}{2}$" x $2\frac{1}{2}$" - prepackaged sterile
13. Pencils - black lead
14. Splints - wire ladder - $3\frac{1}{2}$" x 31"
15. Wadding - cotton
16. Pins - safety
17. Syringes - Disposable - 6cc - 20G x $1\frac{1}{2}$"
                            3cc - 25G x 5/8"
                            3cc - 20G x 1"
                            3cc - 20G x $1\frac{1}{2}$"
                    Insulin - 2.) x 5/8"
            Glass - Luer-Lok-30cc
                            10cc
18. Needles - 18G x $1\frac{1}{2}$"
            20G x $1\frac{1}{2}$"
            15G x $1\frac{1}{2}$"
19. Laryngoscope - MacIntosh - with handle - Size 3
20. Endotracheal tubes - child & adult - with duff-sizes 14-36
21. Adapters for endotracheal tubes
22. Suction catheters - plastic - disposable
23. Nasal oxygen catheters - plastic - disposable
24. Oxygen connecting tubes - plastic
25. Oxygen masks - plastic

26. Knife - handle #3
27. Knife - blades - sized #10 - 11 - 12 -15
28. Collins tongue holding forceps
29. Sierra Shelden tracheotome
30. Lyovac Normal Human Plasma - 250cc with administration set
31. Normal saline solution 500cc
32. Venopake with needles
33. Dressing sets - sterile - (hemostat-forcep-scissor)
34. Sponges - gauze - cotton filled-prepackaged sterile - 2/pkg--4" x 4"
35. Huck Towels - 18" x 36"
36. Sheets - 72" x 99"
37. Gloves - surgical - sterile
38. Aeroplast - dressing spray - 6 oz. can
39. Mercresin
40. Alcohol 70%
41. Zephiran with anti-rust
42. Zephiran - aqueous
43. Catheters - retention - 14F and 26F - 30cc balloon
44. Suture - Medium chromic - Type C - 00 - 0
45. Sterile tray containing:
          Needle holder
          Kelly hemostats - $5\frac{1}{2}$" - straight
                                      - curved

          Tissue forceps - Russian - 6"
                              - Mouse-tooth x 2 teeth - $5\frac{1}{2}$"
46. Suction machines - portable - (2) - electric
47. Pulmonators - (3)
48. Oxygen gauges - (4) for Type E cylinders
49. Oxygen cylinders - (10)
50. Infusion stands - (10)
51. Tables - 3 x 3 feet - (3) - folding type
52. "Horse Leg" stands for litters - (10 pr)
53. Blankets - wool - (100)
54. Tycos B/P cuffs - hand model - (6)
55. Ford stethoscopes - (4)
56. Litters - (30)
57. Cots - folding - (10)
58. Lamps - Goose neck - (2)
59. Kraft bags - Q.S.
60. Paper cups
61. Paper towels
62. Log Book
63. Medical Tags
64. Hand brushes - sterile
65. Adaptic gauze
66. Kling gauze
67. Tongue blades

68. Applicators
69. Alcohol sponges - prepackaged sterile
70. Aramine-refrigerated in firehouse kitchen, directly off reception site
71. Adrenaline-refrigerated in firehouse kitchen, directly off reception site
72. Hand towels - 2/pkg. - sterile
73. Elastic bandage 4"

DISCUSSION OF PAPERS ON PLANNING
Charles Rainey*

My remarks will, as far as possible, be directed towards the last three papers, however, I will also take some liberty in commenting on a few of the points that were raised yesterday that seem to carry over to today's discussion.

First, during this symposium on emergency operations we have also talked about emergency organizations. This is understandable because it is difficult to discuss planning of emergency operations without establishing an organizational context. That is, the emergency planner operates within a defined organization and is concerned with specific functions or operations.

I think we can look a emergency organization or planning from serveral viewpoints and this is really necessary in the design of a civil defense or disaster preparedness program. The first viewpoint you could call the jurisdictional considerations. Yesterday Andy Bullis discussed these. These are the questions of delineating authority and responsibility among all the governmental and nongovernmental organizations that may be involved in a particular emergency. Looking at the extreme case of a civil defense emergency, our entire community or entire society would be involved. One of the basic problems that I see is the result of the current, and probably very justifiable, principle contained in the civil defense act, that the responsibility for civil defense is shared jointly by federal, state and local government. The difficulties of working under this principle and developing an effective system is compounded by the numbers of governmental levels that Andy Bullis described. I believe that the principle of joint responsibility results in divided authority. One comment on this jurisdictional aspect of emergency planning relates to Miss White's description of the well meaning volunteer who had been assigned responsibility for civil defense functions and was unable to exercise his authority during an emergency; or perhaps he didn't have any authority and was frustrated in his job. I think the basic problems he encountered had to do with authority in the civil defense program. In my view, the community leaders and the chief executive of the governing body had already abdicated their responsibility by trying to pass it on to this volunteer. His role as a staff assistant to the chief executive should have been established. The chief executive of the community probably would not have run into the problems he did.

The second way to look at emergency organization, the second viewpoint, was discussed today. These are the problems of planning emergency operations. Here you have to consider what functions need to be carried out, under what

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conditions, and how will they be carried out. And in this respect, I think the emergency organization may be considered to be an administrative or an executive type organization. When we are talking about a civil defense organization we have to identify the specific executive or administrative system that should be designed to carry out particular functions.

The third general perspective was alluded to by several of the speakers. It is the problem of direction and control during the emergency. Many of the speakers identified the need for communications. In order for the civil defense organization to operate effectively, certain tangible systems, such as communication systems or facilities are needed. In addition, in the direction and control area, are problems of authority relationships between organization components. The need for medical authority to be recognized at the scene of a medical disaster is part of the direction and control problem.

Finally, there are the problems of planning and building an organization and an operating capability. In this respect you would have to consider the problems of planning, funding, and obtaining the tangible system elements, like communications, that are necessary for the organization to operate during an emergency.

In reference to the particular talks this morning, my comments are from the perspective of a planner who has been concerned with designing a civil defense emergency organization and developing an emergency operating plan. The criteria and analysis that Dr. Lang developed give valuable insight into the problems of emergency planning and the operational problems that should be anticipated, the failure points and the limitations of an emergency organization. However, the day-to-day planner must also be concerned with the jurisdictional problems. Unfortunately, these may be overriding. He has to live and work within his community with the resources and existing organizations in his local government and in his community in general. These may be overriding problems that constrain organization and planning. The comment was made that organizations cannot plan specifically for things they do not know will occur. I believe this is certainly true and I think it gives added weight to the recommendations that were made for simulation, pre-exercise training, estimating the emergency situation, using material like that presented by Dr. Brode yesterday to try to conceptualize what the emergency situation might be, and to forecast what functions might be required even though we do not know exactly what will occur. The greater understanding we have of the potential situation, the better off we will be.

One comment on Dr. Brode's statement that a continuing possibility of a threat which fails to materialize reduces the effectiveness of the organization (i.e., the threat becomes less credible as times goes on). I think this is very, very true in the civil defense program. This morning's paper has a headline, "China detonated their third Atomic Weapon." It was super bomb size. But the same headlines in about 1951, when Russia detonated their first atomic device and had no capability of delivery, had an entirely different impact on the public and on the civil defense program. Somehow or other since the threat has persisted over the years, its credibility has diminished.

Dr. Adelson's discussion of the Watts Riot, and to some extent the paper yester-
day on the civil disobedience, has to a great extent changed my perspective of
the emergency organization and the function of disaster planning. Until this
time I have only been concerned with emergencies created by some physical phe-
nomena affecting the community; not emergencies created by an element of the
community. He identified four phases of an emergency caused by civil disturb-
ance. These quite closely correspond to the phases that are generally used to
describe a natural disaster or a civil defense emergency. He titled them,
"Start-up," "Venting phase," "Opportunistic phase" and "The end game."

In our emergency planning, we've generally thought of the pre-emergency period
as a phase which might include a crisis and terminate at some warning. The
second would be the emergency phase (i.e., a flood). This would be followed
by some initial recovery phase when the efforts were directed towards doing
what could be done for the survivors, maintaining the community, and getting
together a recovery program. Then the final recovery or rebuilding phase. I
think these correspond to the phases that you have identified. We found them
very helpful in civil defense and disaster planning. Dr. Adelson identified
the communications problems up the chain of command; among units; between the
types of units; and between the power structure and the community. These prob-
lems prevail in any type of emergency and have been identified by most of the
speakers in the general category of communications. In designing an organiza-
tion and planning emergency operations, we have to provide for the physical
means, including communications needed for direction and control.

Dr. Jackson made some very vital points which I think can be related to the
four methods of looking at civil defense emergency organization and planning.
First he made the point that the medical profession is generally detached from
the community. That is, it is generally not a part of the local government.
The profession is generally a non-governmental organization although there may
be a community hospital. The problem of coordinating between governmental units
which Andy Bullis raised yesterday is just as germane when you consider the
problem of coordination between governmental entities (cities, counties, spe-
cial districts) and non-governmental organizations that may operate on an area-
wide basis or may serve only part of a community. The medical profession is
one example, power companies are another. There isn't a one-to-one correspond-
ence between the governmental structure and the non-governmental professional
or service structure. Dr. Jackson's checklist evaluation of a hospital disaster
plan rang a bell. For many years I was involved in the review of local civil
defense and disaster plans and we had no good checklist. We tried to develop
one. We knew it was needed. It is still needed and I hope that you have one.

His separation of the medical and health functions is a problem that has been
recognized, but I'm not sure has been solved often enough. The members of the
medical profession are not under the county public health director, yet in many
of the plans I know of, the county health director is designated as the director
of emergency medical and health services. He may be an M.D., but he is not part
of the team and his normal functions relate to activities like environmental

sanitation. Public health functions are quite different from the medical functions. If these functions can be separated I believe it will be very worthwhile. The difficulties of doing it arise when a local or state civil defense or disaster planner is faced with jurisdictional problems, looks within his community for someone to carry out this function then finds that he has a director of public health. It is difficult for him to look beyond this available man. The Director of Public Health is likely to accept the function from the civil defense aspect because, first, there may be legislation or a requirement that any public employee is automatically a member of the civil defense organization and, secondly, he may believe that he really may never be faced with this responsibility. So it is rather easy for the Public Health Director to accept such a job. Afterwards, I would like to ask if this county medical society plan that was developed in Texas is really integrated into the total community organization.

Finally, in discussing the emergency medical operations, Dr. Jackson identified the sorting technique, (or triage), and identified the requirements for diagnosis and prognosis. The same concept can be applied to many other functional areas. During an emergency the civil defense director is faced with responding to many problems. He also should be able to anticipate future problems. This requires some kind of a sorting technique, including diagnosis of what the current situation is, and estimating what the future situation will be. This is not a job that can be done without planning. All this emphasizes the need for a serious approach to designing civil defense emergency organization and planning: A serious approach hopefully that will develop professionalism throughout the organization so that we will avoid some of the problems Mrs. White raised yesterday.

PANEL FOUR

PUBLIC IMPACT

I. PUBLIC REACTION TO EMERGENCIES
Jiri Nehnevajsa[*]

Emergencies are situations in which an unexpected event produces a sudden dis-
crepancy between the state of affairs that normally ought to exist at a given
time and the actuality. More specifically, emergency conditions generally
exist when the event poses an acute threat to life or property or both.

Each potential emergency-producing event is knowable in that the occurrences
can be inventoried save only for those rare phenomena which may yet never have
taken place. Each event within an inventory can be characterized by an
empirical probability of occurrence and this is but its relative frequency in
the past.

Whether or not such probabilities are actually known is immaterial since they
are, in principle, knowable. When or where specific emergency situations will
arise as a consequence of which event(s) is, of course, not known. Indeed,
this is a central characteristic of all emergencies and, perhaps, an aspect of
their broader definition.

Some emergency-producing events are man-made and others are phenomena of nature.
Fires due to lightning or to spontaneous combustion, hurricanes, tornadoes,
earthquakes, volcanic eruptions, snowstorms, droughts, many diseases and most
deaths, are sufficient examples of interventions by nature into the routine
course of human affairs. Arson, injury of another person, murder, riots, revo-
lutions, wars, strikes, blackouts, explosions, aircraft, ship, rail and car
collisions and wrecks are examples of the former.

Man-made emergencies occur due to negligence, accidents attributable to human
error, or to malfunction of man-made tools and equipment, or they occur by
deliberate choice.

These emergencies can be prevented generally, at least in principle. At the
minimum the probability of the crisis producing event is subject to human con-
trol and depends largely on the willingness to tolerate particular classes and
magnitudes of risks. Nature-made emergencies cannot be prevented but damage
limiting systems can be designed and implemented to decrease their severity.

With regard to some events which produce emergencies, tactical warning time can
be made available. This means that the timing, intensity, and distribution of
the impact of an unwanted event can be predicted over short durations. Some

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adaptive measures then can be taken to degrade this overall impact. That is to say, between warning and impact significant gains in saving life and property can be made even though the destructive event itself cannot be prevented. This is so in the case of floods, hurricanes, tornadoes, volcanic activity, or air attacks. Within limits, paralyzing snowstorms and droughts are also similarly predictable.

In other emergencies, insult to life and property are themselves events which mark the onset of the crisis; such as with fires, earthquakes, explosions, assassinations, blackouts, revolutions. The human and material cost of the initial impact can thus be neither avoided nor decreased but appropriate measures can reduce the damage and destruction which would be insured in the absence of such measures if the emergency-producing event followed its natural path to consummation.

Some events create an emergency situation just because they happen and whenever they happen: fires, floods, hurricanes and tornadoes, volcanic activity, earthquakes, wars, riots, revolutions, explosions, murders and assassinations, blackouts, accidents and disasters in air, sea or road traffic.

Other events lead to emergencies in the context of what might be termed "sociology of scales." Thus, a certain amount of snowfall will have a paralyzing effect upon a community but less than that amount is simply tolerable and an aspect of seasonal routine. A drought does not begin after two or three days without precipitation. Its onset as an emergency is generally related to the use-factor of stored and available water supply. We do not speak of "epidemics" when three people get disabled because of an attack of the Asian flue virus. In a very important sense the social cost of absenteeism resulting from confinement due to illness helps to define the hazy boundary of an "epidemic." Indeed, we listen to specialists of the medical profession to delineate the boundaries. The same kinds of consideration apply to air and water pollution problems. Still other events lead to emergencies only in a contingent manner, and yet differently from the way previously cited. "Strikes" are a good example. They establish conditions under which the probability of other emergency-producing events may be enhanced, such as interpersonal and inter-group violence, vandalism, runs on stores which may remove from the market-place the needed goods through a highly inequitable distribution, and so on. "Strikes" may contingently produce an emergency in that their chain-reaction affects variably the instrumentally related segments of the national economy and thus bears upon its productive capacity and the employment level.

The several events as triggers of emergencies vary in what might be termed their "natural future." Given the parameters of the circumstances at the onset of the event, its duration and intensity are basically predictable to certain degrees. Thus a fire will burn itself out. Once its specific location is known, its subsequent behavior, assuming no human intervention of any kind, will obviously

depend on the climatic conditions at the time and the distribution of other
ignition points in the vicinity. Following a snowstorm, the snow will melt
even though perhaps only after weeks or months.

In other words, most nature-made emergency triggers move from their initial
impact toward termination in a fairly predictable manner, and the traceline of
the intensity function can be also reasonably well estimated. Man-Made
emergencies are not as predictable, and the termination requires some kind of
human intervention: wars _may_ last for a very long time, and the intensity of
the associated violence does not behave, over time, in an easily forecastable
manner. In the thermonuclear age, the assumption of a spasm conflict implies
maximum intensity at the outset with waning impacts thereafter, and it often
implies a conflict of a shorter duration so that the intensity curve has a
rapid rate of decline. But other types of nuclear wars do not display either
of these characteristics _ipso facto_.

An earthquake, for instance, lasts only seconds or perhaps minutes. If a sub-
sequent tremor occurs after some lapse of time, it is, in a sense, a "new
earthquake" the consequences of which will be cumulative in more than the
arithmetic progression.

An explosion, of a basement furnace for example, lasts but a fraction of a
second, although some of its by-products, such as collapsing structures or
flying debris may accentuate the initial impact for several seconds. If a fire
breaks out as a consequence, as it often does, this new event then behaves in
accordance with its own properties, even to the point of triggering subsequent
explosions within its path.

The intensity curve which may be associated with each emergency-producing
event thus has both temporal and spatial properties. Peak intensities occur
at different times for different events, and over variable areas with progres-
sively waning intensities both over time and over distance.

We may, indeed, speak of some _initial impact radius_ within which, following the
onset of the event, any damage to life or property takes place; and the
terminal impact radius which might enclose the total area over which damage
occurs if the event follows its "natural course" without human counteraction.

Obviously, the emergency is the more severe, the larger the _initial impact_
radius; and it is the more severe the larger the difference between the
terminal and the initial radii, that is, in all events which pertain to phenom-
ena with actually or potentially self-expanding characteristics. This concept
of initial and terminal radii applies, of course, both to numbers of people in
the impacted area and to property value, especially from the vantage point of
cost associated with the restoration of the _status quo ante_ at least in theo-
retical terms.

Now the intensity gradients as applicable to people reveal such premises as these: minor injury is preferable over severe injury; severe injury is preferable over permanent impairment through maiming or crippling; permanent damage is preferable over death. Similarly, the gradients for property incorporate such notions as minor damage, severe damage, destruction or corresponding scales. No easy trade-off ideas exist between levels of damage to people and levels of damage to property, although the ethos of our society runs strongly in favor of preventing any damage to people before we claim to be concerned over preventing damage to property.

Similarly, there are no easy trade-offs in accepting damage to some people in order to prevent damage to others. But our societal values display a strong preference to protect children over adults, women over men, and, perhaps, younger people over very old ones. Violations of such norms may be fairly frequent, but the values get reaffirmed, nonetheless, in part as a consequence of their being abrogated on occasions.

Let us now turn toward the consideration of some of the main implications of these thoughts for the public response to emergencies.

Perhaps most important is the fact that all societies respond to emergencies preemptively to some extent. This takes the form of institutionalizing a number of social roles which might best be collectively classified as those of "emergency specialists." Which roles do get institutionalized in this manner and how the performance requirements are defined depends on the probabilities of occurrence of various emergency situations and on some vague estimation of their social criticality. Physicians, nurses, dentists, veterinarians, military men, policemen, firemen are typical examples of these roles.

They are expected, as the central feature of their role performance, to handle particular classes of emergency when and if they do occur. Mostly, these are full-time occupational roles although there are exceptions. For instance, many communities have volunteer fire departments rather than full-time specialists. But this seems to be the case only when the geographic area within the department's responsibility is small in units of travel time, density of structures such that most fires, when they take place, remain confined to the initial impact radius, and the relative frequency of fires is low.

Indeed, all men experience illness or injury at some time in their lives; in addition to that, their family members get ill or injured or die. The criticality of the physician's role in all societies thus would derive from the simple fact that all men are in need of medical or paramedical help at one time or another, and the illness-injury-death emergencies are thus quite universal. Indeed, the high status of the physician which all societies seem to accord him may well be a direct consequence of this.

None of the other events which lead to emergencies seem as frequent or ubiqui-
tous. Thus other emergency specialists, such as military men, firemen or
policemen seem to be "doing nothing" when there are no wars, fires or crime
waves. Indeed, under normal conditions, their standing in the society tends to
be generally quite low although it increases sharply when an emergency is im-
pending or one actually occurs. Along the same lines, air traffic controllers
lead a rather unheralded existence by far most of the time.

Now a good case can be made for the argument that the very existence of some
of these specialists affects the probability of emergency-producing events.
Thus it may be asserted that a police department is a deterrent to crime in
many instances. This assumes that crime rates would sharply rise were it not
for the existence of police departments. A police force, in this context, pays
its own way in that the total cost associated with its establishment and main-
tenance is believed to exceed the human and material cost which would be
associated with the increase in criminal activity or, for that matter, in
traffic accidents.

Similarly, a military establishment may be viewed as a deterrent to wars. It
becomes therefore a preventive of the kind of emergency which makes the exist-
ence of the military socially worthwhile.

There is a peculiar paradox here. Success in handling emergencies gets
rewarded, at least, while the emergency lasts or while its memory remains alive.
But to succeed in this sense, there must be emergencies and there is a societal
preference for their prevention rather than treatment. Success in preventing
emergencies from occurring, even if the sole clue to such success is absence of
an emergency and no cause can be attributed to its absence, makes the emergency
specialists seem superfluous, idle, if not useless. Thus greater success in
this regard correlates with lower rewards, and the emergency specialists must
perform in a peculiar normative structure in which their ideal accomplishments
tend to lead to the least appreciation and reward. This may, in fact, come to
be the fate of physicians as well as measures of preventive medicine keep de-
creasing individual frequencies and severities of illness, and as medical
research keeps demystifying even the most puzzling of diseases.

In addition to specialists who are to handle the emergency by keeping damage to
life and property to a minimum and to restore the status quo ante whenever
possible, societies institutionalize various roles of observers and monitors.
They form the core of what are essentially real-time control systems. Against
the background of information as to what the situation ought to be like, system-
atic observations are made against reality on an on-going, periodic, or as-
needed basis. Thus hurricane watches provide information on any threatening
cloud formations from which projections can be made. Seismographic data and
heat sensors in volcano craters permit the assessment of probable activity.
Weather information leads to statements about possible snowstorms or excessive
rainfall.

River crest data permit the evaluation of prospective flooding danger. Radar
returns in air traffic control centers yield on-going data to be checked against
flight plans. Intelligence inputs lead to the continued reappraisal of the
threat of war. Informers and infiltrators into groups and organizations which
a society might have a reason to fear generate data which may provide estimates
of rioting or of revolutionary activity.

All these are examples of control systems of one kind or another. The systems
themselves are not capable of preventing the event which might produce an
emergency. But they do provide <u>tactical warning</u> and they provide <u>strategic
warning</u> in those instances in which cause-effect chains are fairly well known
and longer range predictors already exist.

These are also rather unrewarding societal tasks. There is little action drama
associated with them. In most instances, they are quite routine simply because
the discrepancy between the intended and actual situation such as would signify
an impending emergency is, of necessity, rather rare.

There is a paradox in this as well. The longer the warning time, the more
effective the action can be which will minimize the impact of the emergency-
producing event. At the same time, the less confidence can usually be placed
in the reliability of the warning. Furthermore, the most effective actions
under conditions of emergency are based on discontinuity of routine activities
and operations, and imply some non-routine adaptation to the impending emergency.
Clearly, unless the reliability of the warning is exceptionally high, it is
undesirable to disrupt on-going societal processes both due to the intrinsic
cost of the disruption and due to the fact that subsequent warning signals, even
though thoroughly reliable, will degrade compliance with requirements for
optimal protective measures. The more false warnings of any kind, the stronger
the subsequent signal has to be to elicit similar levels of compliance.

As a consequence, the actual <u>tactical warning time</u> is generally kept to an
absolute minimum and this leads to something less than optimal measures against
the impending emergency. Hence, the decision as to the dissemination of a
warning signal to some probably impacted public is not made on technical grounds
alone although the estimate of the emergency is made on technical grounds and
by experts on the particular class of emergency. In any case, the monitors and
observers of the control systems will get blamed if an emergency situation does
come about without warning time that could be expected in such an emergency.
They get blamed also if an emergency situation does not actualize upon warning.
Yet, the decision as to the actual issuance of a warning signal is normally not
theirs, and it is normally not based on technical considerations alone but on
political ones as well.

In addition to these <u>control systems</u>, the <u>emergency prevention systems</u> and the
<u>emergency handling systems</u>, most societies institutionalize specialized research
roles associated with each emergency and with each major aspect of each emergency;

the control data requirements, the emergency's prevention, and its management.
Indeed, this is a research and development system. Ultimately, it seeks to
understand the causal nexus of events which produce emergency situations, and
to identify maximally reliable ways of preventing such circumstances from ever
happening.

Short of such ultimate attainment, the research tasks, of course, seek to
determine improved ways of doing that which is already being done in emergency
monitoring for tactical warning purposes, in emergency prevention, and in
emergency handling. These are the kinds of middle-range and short-range "fixes"
which, rightly or wrongly, occupy most of the time of most of the researchers.

And another paradox. The academic researchers whose roles permit maximum allo-
cation of time and energy to the basic issues are also most removed from any
concrete situational knowledge of the phenomena which they must study. The
researchers outside of the ivory tower community who often do have the concrete
knowledge of the problems which they seek to solve, find themselves faced with
demands for middle-range, and usually short-range, fixes rather than with an
opportunity to search for more basic answers.

Finally a few words must be said about those roles which are associated with
emergency recovery systems. Some recovery may be possible while an emergency
situation still prevails. But it may be useful to think of recovery systems
as related to the post-emergency era. Loss of life, of course, is irreparable
and the prior state of the system can no longer be established no matter what.
Permanent injury is similarly irreparable, although recovery is possible up to
the maximum capacity compatible with the nature of the injury. In all circum-
stances of damage to life short of death, the recovery functions take the form
of convalescence. In regard to damage to property, the recovery roles are
basically identical with routine performances of tasks concerned with recon-
struction, repair and maintenance. Once an emergency has terminated, the
rebuilding of a house out of the rubble is in no way different from destroying
an old structure and replacing it with a new one. Thus most of the recovery
roles are of the day-to-day variety and require no specialists beyond those
which a society utilizes under normal conditions.

However, certain social roles do exist which make recovery easier or speedier
or which, in any case, establish the necessary conditions for making it possible.
These are roles associated with insurance contracting, appraisal and disburse-
ment. It is well to note that hardly any insurance provides resources for
recovery against man-made hazards of many kinds, such as wars, riots or revo-
lutions, whereas the more predictable occurrences, man-made or nature-made, are
insurable.

Societal arrangements for institutionalized emergency operations through re-
search, control, prevention, handling and recovery systems involve the greater
investment the more frequent, wide-spread, and intense the emergency. Some

formal provisions exist, however, for the counteraction against all emergencies and the basic problem of public response must be viewed in the context of the already established means for coping with different kinds of problems. For in part, the public response does consist of the lukewarm or enthusiastic support of the occupational roles which are involved in the various phases of emergency situations.

An appropriate public response is required if potential damage of emergency situations which impact a segment of the public, or all of it, is to be held at a minimum.

One, any warning signal which gets issued must be understood for what it is, although the system for insuring availability of the warning is developed and implemented as an aspect of what we have termed the emergency control system.

Two, the warning signal, even though understood, must be credible. There must be an assumption, or knowledge, that the signal comes from sources authorized to issue it, and that the warning has high reliability.

Three, members of the public must act effectively following the warning or at the onset of an emergency (in those instances in which there is zero or near-zero tactical warning time). This means that the public must be aware of the appropriate responses and must act accordingly.

Four, appropriate responses are similarly required during the emergency. These required responses will generally be quite different from those which provide the behavioral bridge between normalcy and the emergency situation itself during the warning phase or at the onset of the crisis.

Five, appropriate responses are also essential in the recovery phase if it is to be accomplished, or at least facilitate, in minimum time and at a minimum additional cost.

Such requirements as these are easily stated but extremely difficult of attainment. The educational and communications tasks are thus quite formidable. Indeed, it is fair to argue that the problems might be nigh unsurmountable.

    (a) Since the public has delegated the social responsibility for emergency roles to specialists, and since this holds for all known emergencies to varying degrees, the motivation to learn and retain response patterns appropriate for a variety of possible hazards of existence is either totally lacking, or is exceptionally weak as long as the threat level does not exceed some threshold value.

    (b) The greater the public investment in particular emergency systems, the more difficult it generally seems to be to impart information to the public about its role in an emergency. This

is so because of beliefs in basic correspondence between the magnitude of investment and quality of the damage limiting systems.

(c) The longer the estimated tactical warning time, the lower the receptivity to acquiring pertinent information about appropriate behavior in an emergency while no such emergency exists or is not clearly impending. This is often based on the belief, perhaps thoroughly invalid as it may be, that there would be sufficient time in which to learn and implement individual and family counteremergency measures. Along with this goes the assumption that information about appropriate actions would be available in the period between the warning signal and the onset of an emergency situation anyway.

(d) Since emergencies concern events which pose an acute threat to life and property, there exists a general preference not to think about emergencies at all due to the death and destruction symbology which they evoke. This further re-enforces the already weak motivation to assimilate relevant information concerning behavior under emergency conditions.

(e) Under conditions of normalcy, the time and energy of most people are already used up in various activities which are rather clearly patterned. Any new information or knowledge which is unrelated or unrelatable to such patterned actions requires reallocation of some of the time and energy, and short of an acute threat, this is unlikely to happen especially since other men are known to have patterned their life activities around the handling of emergencies on behalf of the larger community.

(f) These kinds of conclusions are in no way incompatible with the persistent finding that the public is strongly supportive of damage limiting programs, for instance, of measures of civil defense against a nuclear attack and of all national defense measures, while it lacks a sense of urgency which would lead to a great deal of public activity in regard to such programs.

(g) Most people claim that they would volunteer their services for emergency operations, and only very few Americans argue that they would decidedly not do so. This is also compatible with the idea that the demand for volunteers will not go unheeded if it is specifically made, and if the purposes of volunteering are clear; but little self-generated volunteering can be expected especially the greater the existing investment in a particular damage limiting system.

(h) Receptivity to taking preparatory steps to ward off the worst consequences of an emergency is related to the estimate of probability that emergency-precipitating events will actually occur.

(i) Events which have the effect of increasing the probability of a major emergency produce excessive interest and activity in the direction of taking counteremergency measures. This has been the case of both the Berlin wall and the Cuban quarantine crisis.

(j) Protracted situations which otherwise might be viewed as emergencies, and initially are so considered, become aspects of the status quo and thus ingredients of "normalcy" and do not produce sustained public interest and activity in the direction of counteremergency measures. Thus the Berlin wall crisis has become integrated into the pattern of day-to-day thinking and activities, and no longer constitutes an emergency. Thus the cold war itself in its persistent oscillation of tensions and the mobilization of resources which it has required over the years, has also become an aspect of "normalcy." The escalated conflict in Viet-Nam is similarly integrated into routine modes of the thinking of most people and does not constitute an emergency from the vantage point of the general public.

(k) When events which pose an acute threat do not climax in the actualization of the threatened emergency and become integrated into the overall assessment of the status quo by the public, it takes increasingly more threatening events thereafter to produce public reaction of the same magnitude and direction. Thus it seems that the non-escalation of the acute Cuban crisis may partially account for the fact that the modest escalation of the conflict in Viet-Nam produced no appreciable reaction relative to emergency preparedness of the public.

(1) Most events which produce emergency situations are not directly observable and thus are not directly experienced by most people, including those who might be initially impacted in the actual emergency. Thus communications about events have a direct bearing upon the manner in which such events get interpreted as variably threatening.

(m) The interpretation of the meaning of such communications or even specialized warning signals depends in good measure upon the response of official or formal sources to questions which call for validation, corroboration, or refutation. When official sources are ambiguous, the number of alternative interpretations increases

so that effective actions in the direction of counteremergency
measures cannot be initially expected save for a relatively small
proportion of the public. When official sources are positive and
direct as to the meaning of particular events, the interpretation
will follow the direction suggested by such official sources.

(n) The interpretation cf the meaning of events depends in part
on the observation of the behavior of others in the immediate
physical environment. When an individual observes persons in his
immediate environment acting in such a way as to indicate that
the event signifies an emergency situation or that the signal
seems believed to be valid, then the observing individual is likely
to treat the event or signal in a similar fashion to those whom
he has observed.

(o) Under conditions of acute threat or in an actual emergency
situation, a kind of "revision of history" seems to occur. People
who interpret the ᵗhreat level as high, or who are impacted or
potentially impacted by the emergency, remember the past as <u>better</u>
than they had actually thought it to be previously. Thus there
is a motivation to seek to <u>restore the past</u> even though it may have
been quite undesirable in its own time. This induces a degree of
conservatism to the response to threat or emergency itself so that
continuity of values as well as behavior tends to be reaffirmed
rather than undermined ʌt least through the initial phases of the
crisis.

(p) Most important social values are, in fact, idealized represen-
tations of what men "ought" to be like, or how they "ought to act."
This should imply that emergency conditions are conducive to
behavior and valuation which comes closer to fundamental societal
aspirations than is the case in the absence of the emergency. This
alone might accounᵗ for the consistent public cooperativeness and
altruism rather than conflict and egoism which marks the basic
public response to emergencies, at least, over their duration.

(q) The cooperativeness characteri.ing most of the public is
further reenforced by prior direct experience or exposure to credible
information to that effect. These experiences suggest theᵗ <u>organized</u>
<u>and concerted effort</u> on the part of the impacted public, or on its
behalf by others, has in itself a certain damage limiting value or
that it, in fact, may be a prerequisite for effective counter-
measures of any sort.

(r) Further enhancement in the probability of cooperative action
is provided as a consequence of the low information level as to how
to cope with each of the life's emergencies most effectively, so

that susceptibility to information and to compliant action in an emergency leads to similarity in response which has, at the minimum, the appearance of cooperation.

(s) Furthermore, even under conditions of relative normalcy, most people expect most other people to display altruism in future emergencies, and they also claim that they would be co-operative and altruistic themselves. While it might be said that these are but socially expected and socially acceptable verbal statements, the emotional and intellectual commitment which they entail will generally produce an actual response in keeping with the anticipation.

(t) The panic response is generally unlikely in all emergency situations in which tactical warning time is available, specific and credible information as to appropriate actions is disseminated concurrently with the warning signal or immediately following it, and the required actions can be normally accomplished within the available warning period.

(u) The panic response seems to occur only when the appropriate public response calls for rapid movement of people from one physical location to another, and when the movement of one person degrades the capacity of others to implement similar actions. This occurs most frequently in high density locations, and particularly in confined and relatively crowded places.

(v) Unless panic occurs very early in the emergency situation, it is quite unlikely to occur subsequently. This may well explain the reported absence of panic behavior during the recent blackout crisis in the nation's Northeast. Even in crowded elevators or subway trains, the onset of the power-failure would not have been viewed as a credible indication of a prolonged problem, but rather as one of the many localized malfunctions which get corrected generally within seconds or minutes.

These are, of course, only a few key issues in the many-facetted problem of public reaction to anticipated and actual emergency situations. The "public" has been treated here in a rather generalized, but hopefully useful, fashion. For our purposes, the concept has included all persons who might be impacted by an emergency situation initially or during its life-span or as a consequence of its direct aftermath.

We could now consider the various significant sub-publics and begin making statements about the relative distribution of ideas and actions which might characterize each major segment of our population or of the population of any specific society.

Similarly, the analysis should be pursued in its applicability with respect to
each specific emergency singly so that further qualifications regarding the
response and reaction patterns could be made along these lines.

Finally, we have not concerned ourselves about the rather important issue of
deviant behavior and its prevalence under various emergency conditions. This
would, of course, be all behavior which does not follow the general public
pattern on the assumption that our main conclusions about the predominant
pattern are sound to begin with.

These remarks are intended as a further step, perhaps a useful one, in the
direction of development of a theory of public reactions to anticipated and
actualized emergencies. They also aim to sketch out some elements of a frame-
work from which various practical conclusions may be drawn in an effort to
continue improving man's own making, which threaten him with his own
destruction.

II. ACCOMMODATION TO THREAT
Stephen B. Withey*

ecause of the complexity of my subject, perhaps I will accomplish a little
ore by describing the breadth of the area. But first I would like to make a
'ew prefatory comments about what I think we can and cannot say in this area.
ome of the comments are on a set of categories or a checklist that might be
pplied to considerations about accommodation to a threat. Perhaps what I
ill essentially leave you with is this notion of complexity of the area rather
han the depth of our knowledge of it.

think we can make probabilistic predictions about what people will do in
espo se to a threat and have them be fairly accurate. I say this in the con-
ext of probability prediction about a person's behavior in response to a
eries of possible threats that he might encounter. On some occasions we
ight be able to point to conditions where this kind of prediction will not
e true. However, most of the time we would be right. I think we can make
redictions about the behavior of large groups of people, particularly where
here is some organizational or homogeneous factors that facilitate prediction.
e may not always be right; there will be some deviance, certain inaccuracies,
ut probabilistically we will do quite well.

e may not always be able to predict the reactions of a person at a particular
oment in time, but I think we can predict sequences of reaction. In other
o.ds, given this event, what will happen next? Given that, what will happen
fter that? Our estimates are particularly good, I think, when attempts to
ccommodate a threat meet with failure. When exposed to a threat often you
ry something that doesn't work so you do something else; if that doesn't work
ou do something next. Failure itself becomes threatening, in addition to the
ituation you are trying to deal with.

.competence at handling the threat becomes a compounding factor, and we can
redict the sequence of reactions. What we can't predict is the pace at which
uch sequences will move. We do not know how long a person will persist in
rying to do one thing, but we do know that after he makes the decision that
n effort is going to fail, he will then try a certain alternative effort. So
here is some probability of p edicting the general time of that ki d of cha.ge
.. coping with a threat.

e also cannot predict the success of his accommodations to th. en . He may try
ne thing, and if it fails, we know what he will do next; but it might work.
here are a lot of factors like weather, what other people will do, luck, and

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Michigan.

a number of these kinds of things that make a particular accommodation to a
threat functionally correct. This, too, can interfere with prediction because
we do not know for sure what is going to work in the context of the hazard or
danger

As a psychologist, I also think I have some problems in explaining adaptation
to a threat in a psychological sense. Partly this is a matter of vocabulary.
I don't want to use the jargon of psychology because I think psychology itself
is changing. I think some of the things that we have acquired as knowledge
within the last perhaps 25 or 26 years are new or interesting, but we need a
background of information before we can explain them. With those apologies
I'll move right on.

I will tell you what I will not do before I make an attempt to do something.
I will not talk about the problems of social reaction to threat. I will not
talk about social organization, re-organization, or rigidity of social response
or social disorganization, partly because I think this was covered in other
speeches. I will not talk about the reaction to threat of people wo have to
make decisions--who have to lead--who because of that have to treat the threat
impersonally. This is not a threat to them. It is a threat to what they are
responsible for. We get experts who adopt this role. We get lawyers who are
not particularly sensitive to the threats of their clients. This is a legal
game, they know how to play it and are not emotionally involved with the prob-
lem of the poor defendant's reaction. The surgeon goes through a period of
two, three, or four years where he learns not to be particularly sensitive to
the feelings of his patient to a certain extent. He could not carry out his
job if he did not have to regard it as a technique, a technology that requires
certain behavior on his part. Policemen to a certain extent have to regard
things as black and white because they have to make decisions based on such
judgements. That kind of reaction to threat I will not talk about.

Nor will I try and get very psychiatric or very psychological in the sense of
trying to distinguish fears that may be rational and phobias that may be irra-
tional. If you regard white rats running around the floor as a threat, I am
not going to be particularly involved in origins of that kind of thing or how
you are going to react to it. Nor am I going to go into early childhood ex-
periences and what this means to how you may be deviant in some situations.
I am sorry to disappoint you; that's interesting and exotic, but I am going to
be more general. Nor am I going to talk about accommodations to other people's
threat. I am going to assume that the person I am talking about is in a threat
situation himself. Nor am I going to talk about adjustment to surviving threat,
an interesting aspect. Some interesting research is being done, for instance,
on what's happening to people who survived Hiroshima and their attitudes towards
death and some of their values that go with simply surviving. I am not going
to talk about that. What I am going to talk about begins with an assumed sit-
uation of threat. I will attempt to diagram some reactions to that and give
some notions about the variables and factors to be taken account of if you are
going to talk about such situations.

In our lives, threat is so pervasive end ever-present that it is obvious that
we adjust and accommodate to it all the time. There are threats to us and
our extended selves in terms of what we value in our environment. The mass
media are filled with warnings about threats of cancer from smoking or the
hazards of pollution to threats of dire consequences if we don't fill out our
income taxes correctly or buy safety belts or raise our children incorrectly.
Many of these we adjust to without much effort, some cause us some concern and
some we ignore.

Much has been written on this topic from physiology, experimental psychology,
social and clinical psychology, sociology and so forth. It is also the topic
of much that is called military science and even political science and foreign
affairs. There are numerous reviews of this material and I am going to assume
that much of this is familiar to many of us.

I am going to move right in to my topic by sketching out a schematic diagram
of the parameters of the situation that are involved in reaction to threat.
They are not exhaustive but they do represent a distillation of those variables
which seem to be involved during the actual processes or stages of reaction.
What is largely left out are those variables that have to do with the past ex-
perience of the individual, but I believe that they must act through some
influence over the variables I have included.

Let's start with some threat that has to be known by some form of information
transmitted to the individual. This information must be understandable and to
at least some extent credible. If it is not believed that is the end of accom-
modation right then and there. If it is a very distant threat, like death it
can be dismissed with equal efficiency. If it is absolutely inevitable, one
can do nothing but try to cope with one's own fear reactions.

These statements already describe three important parameters of information
about a threat, however. They are its nature, its probability and the intensity
of fear arousal within the individual. By the nature of the threat is meant,
what, in common sense terms, would be a description of the hazard. Any such
hazard carries with it an estimate of the likelihood of occurrence in space and
time that is an estimate which will vary among individuals and is obviously sub-
ject to distortion of exaggeration or minimization. Whatever the consequent
mix of threat there is a certain degree of fear aroused. This is a physical
reaction that will vary according to individual differences and will have to
be dealt with, by the individual, as an increment to the threat.

Any rational person will, at this point, begin to think of, or inquire about
or look for some form of behavioral adaptation. In many instances this cogni-
tive behavior is tied in with the definition of the threat and in many ways
indistinguishable from it. In some cases a habitual response immediately re-
moves the threat. In other cases behavior has to be planned, in some cases
behavior has to be learned or instructions have to be sought. Whatever the
information available to the individual, information about adaptation has the

parameters of the nature of the behavior required, its probability of effec-tiveness in coping with the hazard, and the effort required with its considera-tions of consequences and cost.

Put together these variables describe the various perspectives of a threaten-ing situation. They describe the degree and impact of danger. The somewhat rational appraisal describes the effectiveness of protective measures. The interaction of estimates about the suggested adaptation describe the motiva-tional state of the individual. Together these factors tend to account for the behavior of the threatened individual.

If we schematize these factors, the diagram in Figure 1 arranges them in the order shown.

It might be useful to make some comments about what we know about reactions to threat. The comments should provide an understanding of the function of some of these variables though they will not offer a summary of what is known about the field of reaction to threat.

We know that people react to different threats with varying evaluations. Some people are particularly afraid of certain animals or social events, such as making a speech, or specific environments such as heights. People differ in their reactions to what is strange or curious or horrible. People differ in their ego involvement in a threat depending upon whether they own a house threatened by a flood or whether family members are involved in a danger, or whatever system of values tends to engage particular and unique feelings of involvement with what is threatened.

We know that people tend to underestimate the probability of threatening events. Often this feeling is described as a personal feeling of invulnerability. Any threatening message has to surmount this feeling of "it doesn't apply to me". There is, of course, a certain amount of truth in such a perception since most of us have successfully avoided a great number of threats during our lifetimes. There is a sobering mood when one sees an accident or experiences a close call with danger but it does not last. In some areas where our experience has not been so successful we do maintain a sort of hypervigilance and we are partic-ularly sensitive to cues of danger. As a matter of fact, in such areas we may distort probabilities so as to exaggerate the likelihood of a threat; but this flip-flop from optimism has very clear antecedents.

People also differ in the degree to which threat creates various degrees of physical arousal. Our autonomic nervous systems behave with differential sen-sitivity. Some of us walk around with chronic levels of anxiety that do not provide us with a needed handicap in the race to disturbed, maladaptive states of intense arousal and fear.
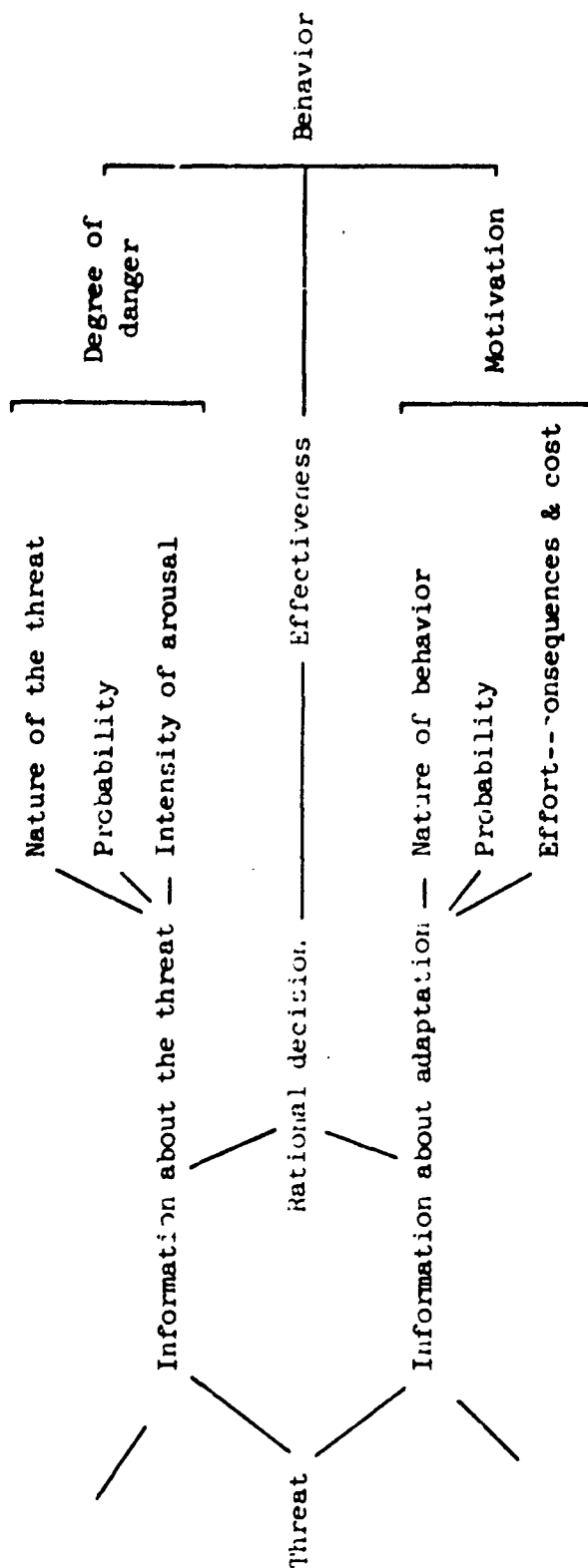
Figure 1. Diagram of Factors Influencing Reaction to Threat

It should also be noted that a certain degree of arousal is necessary for any response to be developed. People do not generally respond to purely cognitive recognitions of threat unless their job requires that kind of behavior. A certain degree of emotional arousal focuses attention and consideration and maintains a state of alertness long enough for some behavior to be developed. However, it is also true that intense arousal is more distracting than facilitative. Extremely high emotional arousal interferes with adaptive behavior and is disorganizing. Such emotions become so preoccupying that all attention has to be given to them and reaction to the threat that precipitated them is suspended.

The work of Janis and Feshbach in this regard is the classical experiment where intense arousal on the horrors of tooth and gum diseases led to little adaptive behavior. Haefner (1956) found the same results with horrible presentations on fallout hazards from H-bomb testing. Other experimenters have replicated the findings but some have found confusing and in a few cases contradicting results.

Janis and Leventhal have come up with an explanatory model, that is to be published shortly, that tends to account for most of the data obtained on experiments of this type. They propose that arousal increases the probability of acceptance of a threatening message up to an optimum where the facilitating effects of arousal are more than the interfering effects of over-intense arousal. After such an optimum point further arousal is maladaptive and disorganizing. However, such an optimum point is not a single point on a continum of intensity of fear, but is an optimum point for a particular kind of threat! Other threats might well have a different optimum point of arousal. The situation can be diagrammed as follows:

Degree of fear arousal
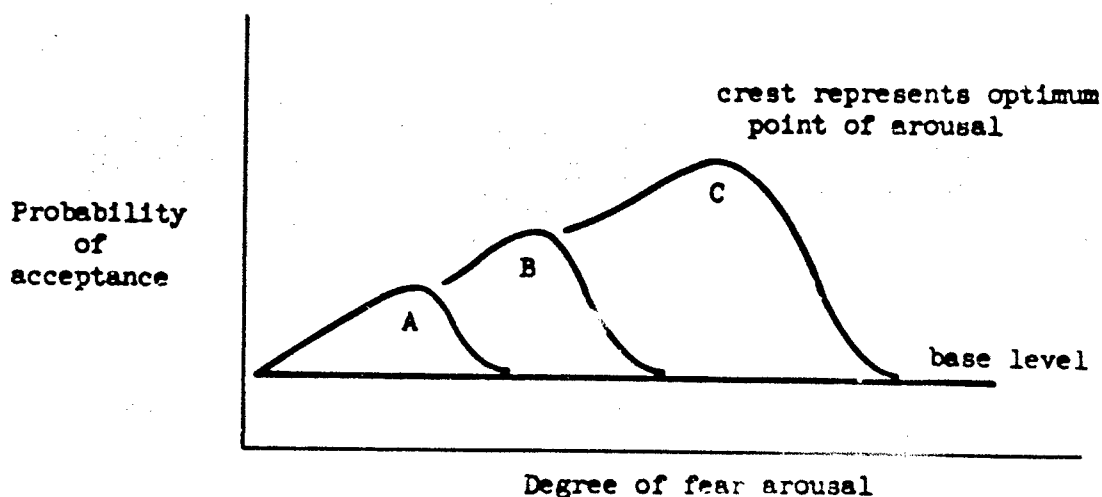
For situation "A" a moderate degree of arousal is optimum but for situation 'C" a much greater degree of arousal is optimum because of the greater degree of the threat that has to be accepted. Such a model would stipulate that no single degree of arousal is helpful or disorganizing but that the location of the optimum point of the curve is going to have to be determined for each class of cases.

This consideration of optimum point of arousal implies that we do not reach very adaptively to little fears when we get very emotionally aroused, nor do we react adaptively to big fears with only moderate emotional arousal. What seems to be implied is that a threat must somehow be validated in terms of emotional arousal for it to be accepted in any terms that require behavior or adaptation.

This notion of balance also carries over into information about adaptive behaviors. We are not likely to behave defensively without some probability of success. The nature of a threat, as a matter of fact, is intimately tied in with our ability of effectiveness in doing something about it. Pneumonia, for instance, is much less of a threat now that we have highly efficient drugs for curing it.

Adaptive behaviors are much more likely to occur if a person is clear as to what adaptive behavior is required. If information about suitable behavior is vague or unclear it is, to that degree, less likely to occur. Also, if there is not some clear connection between the threat and the one does about it, the protective or defensive behavior is likely to be reduced. It is difficult to assay the probability of effectiveness of adaptive behaviors unless one has some clear insight into the sources of the adaptive behavior proposed.

People are also prone to be economical in their expenditures of adaptive behavior. Small threats require only small expenditures. The commitment of costly resources requires an even more costly alternative to their non-commitment. In experimenting with adaptive behaviors, there is a sequence from attempts at the efficacy of cheap behaviors to more costly behaviors if the initial behaviors do not succeed in extricating the threatened person from the precipitating situation of stress. It is analogous to the increasing commitments of a nation faced with hostile actions from another nation in the escalation toward all-out war. It is also analagous to the increasing sacrifices of physical defenses against physiological stress.

The actual occurrence of adaptive behaviors, however, requires more than just a credible threat and the existence of some adaptive behavior. Everybody doesn't use seat belts. Everyone who could get flu shots does not capitalize on the opportunity. Many who think that lung cancer has something to do with smoking refuse to stop smoking.

In an experiment the value of tetanus shots were sold under various degrees of arousal of the nature of the threat of tetanus. Those with more than moderate but less than extreme arousal found the message credible and acceptable. This was in accord with the model just described. However it was the information on follow-up, where to go, when to go, what getting a shot meant, etc., that made the difference in whether people got tetanus shots or not. Credibility of the message did not lead to behavior unless the supportive follow up explaining adaptive behavior occurred. Similarly one can point to several experiments in which clarity of information, personal commitment to do something, public resolve, group activity, etc. all act as su ortive factors in gaining a follow through to adaptive behaviors.

There are also ways of life, training, and even personality factors that lead one to behave rationally and deliberately more often than is the case for others. The biggest correlation with seat-belt usage is degree of education. Rehearsal and training tends to raise the probability of certain behaviors occurring. An instructional set focuses attention on certain behaviors more than others. Further, particular roles in a disaster situation lead easily to certain regular, role-demanded behaviors for firemen, soldiers, policemen, physicians, ministers, etc.

Finally, it might be worthwhile to look at some of the factors that seem to lead to maladaptive behaviors. There are the constraries to many of the factors that have already been mentioned as facilitative factors in developing adaptive behavior. Perhaps four factors stand out prominently in the literature. Perceived entrapment, which might be interpreted as a sudden worsening of the threatening situation and the probabilities for effective action, is certainly conducive to panic and acutely disorganized behavior. Separation from one's family or primary group is also disorganizing. Individuals often behave with what seems like disregard to their own adaptation in conditions where they cannot get to loved ones who are in danger. For many people, witnessing injury and death is acutely disturbing and arouses such acute emotional response that it is overpowering. Lastly the phenomenon of the "near-miss" which is a mixture of the factors of emotional arousal, sharp change in estimated probabilities of threat and defense, along with feeling of guilt at having been spared with emotions of bereavement often turns out to be completely disorganizing.

It appears, then, that accommodation to threat is an extremely complex phenomenon. But into a social context and with changing environmental conditions it is indeed an area of behavior subject to many influences and pressures.

III.   NEW YORK EMERGENCY PLANS AND EXPERIENCE
                               M. J. Asensio*

INTRODUCTION

The title of my presentation may be somewhat misleading. Inferentially, it
implies that the plans anticipate the experiences related thereto. Although
I advocate pre-planning in depth, I recognize that every experience leads
inevitably to some refinement in plans. Which comes first is sort of a
"chicken-or-egg" question. In the large, probably experience, or a known
threat, has been the genesis of plans.

The greatest impetus to planning against emergencies in New York State has
derived from the threat of nuclear attack. Successive Governors of three
administrations have supported the gradual development of the New York State
Defense Emergency Act into a comprehensive document that requires the partic-
ipation in planning and training not only of all departments of State Govern-
ment but also of subordinate political jurisdictions.

At state level is considerable complement of personnel comprises the Civil
Defense Commission in its day-to-day operating capacity. This body is organized
along lines quite comparable to those of military units and I have the good
fortune to be its Director. It is reinforced by the specific assignment to
civil defense, of numbers of people in other departments such as Health, Wel-
fare, Education, Public Works, etc. These individuals are responsive to the
needs of the Commission.

ORGANIZATION

But I am anticipating the next order of business in demonstrating New York
State's preparations for maximum emergency. It is better to delineate the
organization at successive echelons which has been prescribed by the State
Emergency Act.

At the apex is the State Defense Council of 23 members, including the Governor
and 10 others who achieve their membership ex officio, and 12 persons appointed
by the Governor. The Council is charged with the exercise of all state govern-
mental functions, as necessary, to include legislative, judicial, and executive.
The appointive members include influential citizens such as Mr. Henry Luce of
Time, General Sarnoff of RCA, the Honorable Roswell Gilpatric, erstwhile Deputy
Secretary of Defense, and others of similar caliber. The distaff element is

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*Lt. General Asensio is Director of the New York State Civil Defense Commission.

represented by two leading personages. The fact that the appointed members outweigh in number the ex officio is deliberately contrived so that political considerations may not outweigh the practical. I consider this fine point to be indicative of the degree to which all pertinent factors have been considered in development of the basic plan.

At the next level is the New York State Civil Defense Commission of 18 individuals. Fifteen of these are ex officio members; the heads of operating departments of State Government. Two are local directors representing the field element of civil defense and appointed by the Governor. Also appointed by the Governor is the Chairman of the Commission; a position held in the past by such outstanding personalities as General Lucius Clay, Admiral Kirk, and General Anthony McAuliffe of Bastogne fame (oft-quoted author of the "Nuts" reply). At the present time General Schuyler, Commissioner of General Services, who would have been a member in any case, has been designated Chairman and I, by virtue of the vacancy thus created, become the 18th member. This arrangement exemplifies the complete integration and involvement with other elements of State Government with the civil defense effort.

It is immediately obvious that the Civil Defense Commission per se could not undertake the supervision of the daily activities necessary to assure a progressive development of capability in civil defense. The Defense Emergency Act therefore provides, "The State Director, with the approval of the Commission, shall appoint and may remove such deputies, assistants, counsel, and employees as may be deemed necessary and fix their salaries within the appropriation made available therefor." All indications to the contrary, notwithstanding, I should like to assure you that this is somewhat less than the carte blanche that it appears to convey. Legislative and budgetary restrictions and requirements still exert a major influence. It does afford a basis for the development of a central operating nucleus at State level to assure a balanced approach to civil defense within the State. An organization similar to the military with general and special staff provides for administration, intelligence, operations, supply and plans, with special reference to the critical areas of communications, counseling service, warning, public information, chaplain, rescue, counsel, and women's activities. The contributions enjoined upon other departments of government are regarded in New York State as concomitants of office. Participation is assured. Membership on the Commission proper and the semiannual periodicity of meetings of the Civil Defense Commission allow for conversance with operations and progress on the parts of the Commissioners concerned.

New York State is large as to area and as to population. Its area of slightly less than 50,000 square miles includes approximately 18 million residents. The law provides that every county and every city shall have a civil defense office and a civil defense director. Provision is made for consolidation of cities with their respective counties upon mutual agreement. Five counties are included in New York City alone. The other 57 counties are organized into districts of nine or ten counties each. In time of emergency the district headquarters will be manned by complements of about 100, of which only seven will

e permanent while the rest come from other state agencies of Government or
olunteers. The district offices constitute extensions of the Civil Defense
ommission and are not coterminous with any subordinate political subdivision
f the State. They have been established to overcome the obvious impossibility
f dealing, in time of emergency, with 58 separate entities. The number of
irect contacts is thus reduced to seven. Cities, except for New York City,
ill report through the counties in which they are geographically located.

ıe National Defense Warning System within New York State has been configured
ɔ districts. Each district contains two circuits to include all assigned
ɔunties. So far as I have been informed this arrangement--which I deem very
ffective--is peculiar to New York.

JTIES

ıe New York State Defense Emergency Act includes four pages of specific
ıarges to be incorporated in the comprehensive plan for the civil defense
? the State. These fall basically into three general categories: the pro-
:ction of individuals, provision for the continuity of government at all
:vels, and plans for recovery and rehabilitation. Shelters to guard against
ıllout radiation must be provided for every person in the State. This is a
ırge order. I have mentioned the population of 18 million, and now I can
:ate that New York is blessed with available spaces of protection factors
' 40 and above for more than 32 million. Eighty percent of these happen to
· located in New York City and, even for the population of that community,
.is 80 percent is maldistributed. This means that except for isolated in-
.ances, no part of the State can provide adequate facilities of shelter in
e event of major emergency. Few realize that despite major concentrations
· population, New York State is largely rural. I have found, to my surprise,
at it is the second state in the union in dairying and reputed to be first
 so-called "mapling." There are entire counties with no public shelters
rthy of the name. This combination of circumstances led New York State to
dertake the function of counseling farm and home owners alike as to remedial
asures that might be instituted on an individual basis. New York has devel-
ed a computerized procedure whereby an interested party, upon submission of
mensional and other data, may be advised as to measures to compute protection
ctors on a deliberate or hasty basis. This is the forerunner of EFPH, a
mplified version of evaluation of fallout protecti ɪ for homes which is cur-
ntly incorporated in the Federal Guide for Community Shelter Plans. In this
ınseling program lecturers have been provided for industry; for labor unions;
r local organizations, and for schools. More and more response has been
rthcoming as the program attains maturity. In a metropolitan area such as
ɪ York City, logistics constitute an awesome problem. Better than three and
ree-quarters million spaces in New York City have been stocked with shelter
ɔplies. But the cost of doing so, although not unreasonable, represents a
ısiderable outlay. In a metropolis or megalopolis no such action may be
ıe as a community effort. It must be undertaken as an operation competitive

to others that are part and parcel of everyday existence. In summary, let it be recorded that as against the 18 million residents total, there are at the present time spaces located, licensed, and stocked for 32,330,000, 15,597,000 and 6,309,000 persons respectively.

Providing for the continuity of government is an effort to perpetuate the democratic system of home rule which has been an underlying feature of the State since its very inception. We are utilizing this current form of government in the execution of our civil defense responsibility. In this, and other purposes, no desirable substitute has been found. All echelons of government are, therefore, charged with indicating lines of succession and making arrangements for duplication and storage of essential records.

In view of the widespread damage and destruction which might be experienced as a result of a nuclear attack on the United States, plans for recovery and rehabilitation must be prepared in detail. As with so many fields of civil defense activities, the reaction to attack must be preplanned. Reliance upon instinctive reaction almost certainly would introduce unacceptable delay in return to normalcy. This is a very complex matter with which to deal since it affects every phase of activity and every element of our economy. Its complexity is a reflection of the highly compartmentized society in which we live. Each of the compartments must be examined and each must be represented in developing pertinent plans. We must deal with transportation in each of its four modes, with food and its processing and distribution, with power, with manufacture, with banking and insurance, and many of the activities which we have come to accept without even thinking about them. We must assure the continued availability of essentials and redirection of the resources devoted to items which, in time of stress, are not absolutely essential to survival.

The foregoing is hardly inclusive, but rather is illustrative of the planning problem confronting New York State. Because the total job embodies provision against the most awful situation which we can now visualize confronting us, it was natural that in September, 1963, the Governor of New York State saw fit to designate the Civil Defense Commission as coordinating agency in the event of natural disaster. This means that when the elements get out of hand, civil defense will be called upon to play a role which might be construed as an exercise to improve its capability to perform its major function. I would like to emphasize that the role of coordination means exactly that. Civil defense does not have the means nor the expertise, nor is it intended that it arrogate any operational functions. Usually some other element is charged with the operating responsibility. As a case in point--during an outbreak of forest fires in the State in the very dry autumn of 1963, our investigation revealed that the Commissioner of Conservation was by law invested with the responsibility of conducting the fire fight. Our responsibility then became to act as the one agency to which he had to turn in order to enlist all available services of the governments within or without New York State to include even quasi governmental. Instead of pushing numbers of panic buttons to find out about equipment from the Department of Public Works, manpower from the Division for Youth

istance from the New York National Guard, what the American Red Cross could
etc., all that was required of the Commissioner of Conservation was to push
panic button and then to have the Civil Defense Commission go into action
uncover all of these possibilities.

TE-OWNED EMERGENCY SUPPLIES

amount of planning can possibly supplant the wherewithal in resources to
omplish its specified purpose. My predecessors have proved themselves to
2 been quite foresighted in acquiring inventories of critical items and I
2 that my tenure may ultimately reflect a continuation of this approach.
items that may be stored against the day of requirement are legion. The
lrability of having them readily available must always be weighed against
t of storage, shelf life, and comparable considerations. One of the most
2ral needs that is encountered in the greatest variety of disaster situations
that for cots and blankets These were procured in quantity during the
ly history of civil defense in New York State. As a matter of fact, one
the race tracks made a considerable donation of these items. They were
imately stored at locations along the Thruway and under the auspices of the
rway Authority in order to afford reasonable availability. From time to
2 their use has been indicated and as the years have worn on it has become
reasingly obvious that deterioration, particularly of cots, must be expected
provided for. Indeed I have come to the conclusion that air mattresses,
rolls, or increased numbers of blankets, would be a preferable solution
r almost any circumstances.

York State, some years ago, acquired 14 miles of light steel pipe of 6"
8" diameter together with ancillary equipment consisting of pumps of several
.cities, chlorinators, and tanks. This backlog, reinforced by Federal sup-
s, proved invaluable in our recent drought experience, even though its pri-
· purpose was to constitute a reserve in case of nuclear attack. During the
. year another increment has been added to the reserve. Because of the
sion to increase transportability and improve handling characteristics, a
ge was made to aluminum pipe. Eight, six and four inch pipe was included
his portion with a more varied assortment of pumps to include some of the
-well variety. The objective is to make progressive additions to the
kpile until a unit may be provided for each of five districts with two
the Southern District.

the years a number of generators have been procured from surplus and by
ct purchase. The number, when weighed against possible need, is relatively
nsequential. These items were acquired when the acknowledgement of re-
ility of commercial power systems was absolute. It is surprising now to
k of the resistance displayed by certain elements toward incurring the
a expenditure to provide auxiliary power when there was an articulate ad-
te of the power companies advising contra-action. There has been a con-
rable change of attitude as will be brought out later.

EXPERIENCES AND RESULTANT MODIFICATIONS

In December of 1964 a seven-county area of New York State, centered on Albany and Schenectady, suffered a paralyzing ice storm which far exceeded in intensity any previous experience. A rapid and continuing accumulation of ice on trees and utility wires served in short order to deprive about 175,000 customers, both families and businesses, of electrical power and communications. Restoring of service required a week to ten days. The entire period was one of subfreezing temperatures. Such generators as were in stock or as could be procured from the Schenectady Army Depot were pressed into service. Surprisingly, six separate water works were found to be without auxiliary power. Only public requirements could be met and these only in part. There was suffering and there was damage from freezing pipes in homes, but the prompt provision of shelters in central locations with the aid of the American Red Cross saw us through with relatively little difficulty   The major issue that was brought to our attention was that our stockpile of generators, particularly with the prospective closing of Schenectady Army Depot, was grossly inadequate. Our budget submission in June reflected a requirement for hundreds more.

I have already mentioned that the need for development of added sources of water through exhaustion of wells or surface supplies exercised more than the immediate stockpile of water supply equipment. Some sixty communities perforce placed entire dependence upon civil defense assistance augmented by expertise of the Department of Public Works and the Department of Health. Modifications that developed I have indicated previously.

Then came the blackout of 9 November 1965. Fortunately it was of short duration except in New York City. It underlined the requirement previously determined for additional numbers of auxiliary generators. It served also to emphasize that there were not readily at hand the means to communicate with the populace of this State on short notice. Despite all measures that had been taken forehandedly, I am sure that no one had foreseen that an emergency could include the entire State as did that blackout. Recognizing that the Emergency Broadcast System could be activated only by the President of the United States, there was a realization that there should be a capability, short of a national emergency, for the Governor to communicate with all and sundry. Thus was born the Interim Emergency Radio System of New York State, which became operational on 15 January 1966.

Starting with the end of January, New York State encountered a general snowfall which concentrated with particular intensity in the central part of the State. Within two days Onondaga County and its principal city of Syracuse were reported to have 45 inches or more, while the communities of Oswego and Fulton reported over 100 inches. Nearby areas, while less hard hit, were overtaxed as to equipment. Upon the declaration of emergency, the three-shift natural disaster team of the New York State Civil Defense Commission went into operation in an endeavor to furnish relief. New York City and counties and municipalities of

Long Island responded in force. The State Department of Public Works and the
Office of General Services sent what plows could be spared and many others
contributed despite a weather prediction that was far from favorable. In rel-
atively short order 78 items of equipment with the personnel for 24-hour opera-
tion had been dispatched to the effected areas, under State Police convoy and
with special clearance of the Thruway Authority. Receiving jurisdictions had
agreed to pay for rental of equipment, operating cost and pay and lodging of
operators. The aid of the American Red Cross was enlisted and its services
included assumption of the major part of the cost for employment of private
helicopters for food and medicine drops to individuals isolated by the storm.
Many lessons of coordination were learned and there were interesting sidelights.
As soon as the situation could be assessed, telegrams were sent to all areas of
the State outside of the emergency contour. To solicit cooperation, appeals
were made by radio, television, telephone, and telegram. Unbeknown to us was
the fact that a reorganization of Western Union concentrated all operations at
Syracuse for the dissemination of book messages. This was discovered only when
responses to our telegraphic message began reaching Commission headquarters two
or three days later. The operators essential to message distribution had been
unable to reach their posts of duty in Syracuse. I assure you that hereafter
any comparable situation will involve a specific confirmation that the necessary
expedition can be accomplished.

CONCLUSION

The foregoing has given you a cursory outline of emergency operations in New
York State with particular attention to natural disasters. It should have
demonstrated that the primary function of civil defense under these conditions
is one of the coordination and assistance to those who are charged with the
operational responsibility, those who are the heads of Government and those
specialists who serve them. I am acutely aware that whatever I do as Director
of the New York State Civil Defense Commission I do, not in a command capacity,
but in the name of the Governor who actually commands. The experiences that
I have recited are those which have occurred in my short tenure. They have
fortunately been few and relatively minor. They have served to indicate that
in preparation for contingencies, dynamism and the exercise of imagination can
do much to improve our state of preparation.

IV. PLANNING A NATIONWIDE NATURAL DISASTER WARNING SYSTEM
Paul H. Kutschenreuter[*]

INTRODUCTION

The Environmental Science Services Administration (ESSA) of the Department of
Commerce came into being on July 13, 1965. ESSA was formed by combining the
Weather Bureau and the Coast and Geodetic Survey of the Department of Commerce
and the Central Radio Propagation Laboratory of the National Bureau of Standards
into a single agency.

ESSA's warning responsibilities derive from the legislative backgrounds of the
agencies that have become its major line components--particularly those of the
Coast and Geodetic Survey and of the Weather Bureau. The warning responsi-
bilities relating primarily to the natural hazards that may affect the general
public include those for tornadoes, severe thunderstorms, hurricanes, blizzards,
floods, tsunamis (seismic sea waves), seiches, storm surges, dangerous sea con-
ditions and drought. Every one of the 50 states is subject to one or more of
these natural hazards.

In addition to the above, there are the cosmic radiation warning and the radio
propagation warning (blackout) responsibilities of the former Central Radio
Propagation Laboratory (now known as the Institute for Telecommunication
Sciences and Aeronomy). Thus, ESSA has cognizance concerning environmental
hazards and disturbances, liberally from the bottom of the ocean to the surface
of the sun.

ELEMENTS OF A WARNING SYSTEM

"Warning" as intended here may be defined as "a notice that natural forces have
produced conditions requiring positive action to protect life and/or property.
Any warning system, simple or sophisticated, must include the five basic
elements shown in Figure 1.

- Detection
- Warning
- Communication
- Action
- Feedback

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[*]Mr. Kutschenreuter is Director of the Office of User Affairs, Environmental
Science Services Administration, U.S. Department of Commerce.
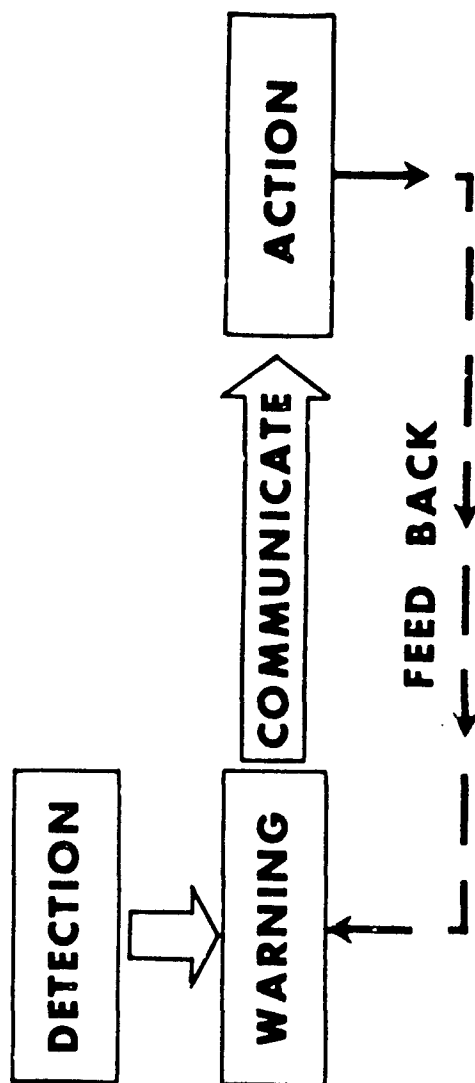
Figure 1

WARNING

The responsible agency must recognize the potential disaster, assess its
seriousness, and determine whether a warning should be issued. First and fore-
most, this requires a thorough understanding of the physical environmental
processes involved. The final decision regarding whether a warning should be
issued, however, involves consideration of a number of extra-disciplinary
factors. Among these are the financial and political implications as well as
the possible effect of such warnings on the normal activities and behavioral
patterns of the recipients.

COMMUNICATION

Communication is used here in the broadest sense of the term. Not only must
adequate physical communications facilities be utilized to convey the warnings
from the responsible agency to potential users, but the warning terminology
must be readily understood without lengthy study of consideration.

ACTION

Based upon his understanding of the information received, the potential user
must be in a position to determine what action, if any, is appropriate to his
own particular circumstances. This, in turn, suggests the need for an educa-
tional program designed to familiarize the user with appropriate protective
action and the possible consequences of inaction.

FEEDBACK

Last but not least is a requirement for feedback of information to the respon-
sible agency. This includes information concerning protective action which has
been taken, as well as information concerning the current state of development
of the hazard (or lack of such development) in order that warnings may be
reviewed, revised, reissued or rescinded.

THE 1965 PALM SUNDAY TORNADOES

From the standpoint of the total number of deaths, the Palm Sunday tornado out-
break of April 11, 1965 (Figure 2), is rated as the second worst tornado occur-
rence in the United States. It is exceeded only by the Tri-State tornado out-
break, which swept from Missouri across Illinois into Indiana on March 18, 1925,
resulting in 689 deaths.

A post-analysis early on April 12, 1965, indicated that the Weather Bureau's
tornado forecasts issued on April 11, 1965, were excellent. Of the 37 reported
tornadoes, 33 occurred in actual forecast areas and at valid times, as shown in
Figure 2. (Although only two of the 37 tornadoes occurred outside the forecast
areas, two of the remaining 35 actually occurred at about the time one of the

FORECAST AREAS AND ACTUAL TORNADOES- APRIL 11, 1965

REPORTED TORNADOES ▼

FIG. 2
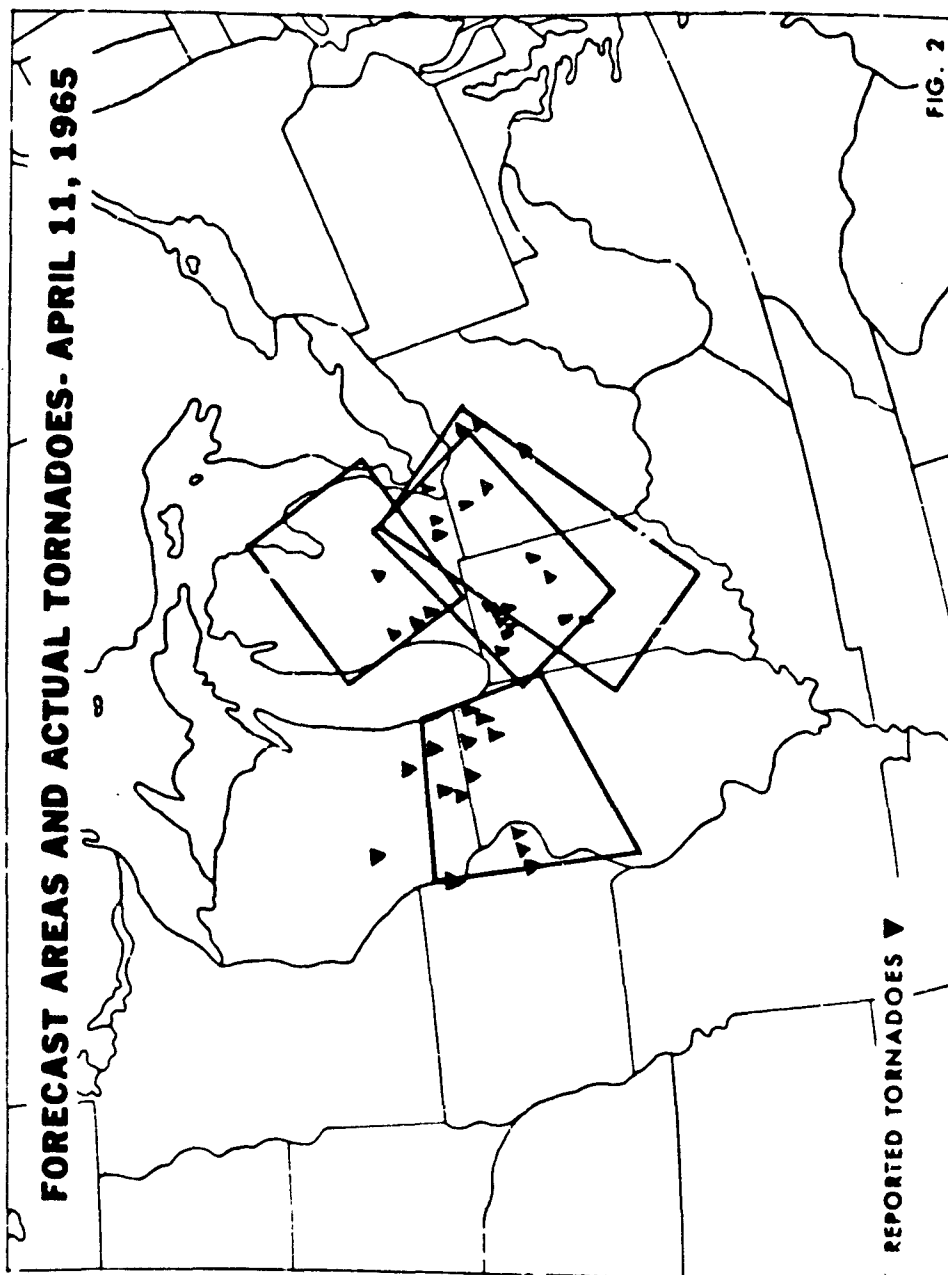
forecasts was being issued and hence are not considered in a "valid" area.) Yet the reported death toll early on April 12 was already approaching 200 and still rising rapidly.

Why then, was the death toll so high? To answer this question, the Chief of the U. S. Weather Bureau, Dr. Robert M. White, (currently Administrator of ESSA) appointed a survey team to look into the situation and to prepare a report with appropriate recommendations.

The survey team visited the devastated area and interviewed a number of those affected. It also interviewed officials involved in the preparation and dissemination of the warnings as well as some of those involved in post-disaster activities.

The team's report[1] indicates that, although from a meteorological standpoint the performance was excellent, there were a number of elements of the warning system (see Figure 1) that required further emphasis and improvement. Most important of these were communications difficulties, failure to take action, and lack of sufficient feedback.

Secretary of Commerce John T. Connor considered the team's findings and directed that an inter-agency group be established to study the total natural disaster warning problem. The National Disaster Warning Survey Group, as subsequently constitute, was composed of representatives of six Federal Agencies concerned with the detection, prediction, and warning of natural disasters and with preparedness and relief measures.

The Group examined all aspects of present warning procedures and in October of 1965 presented findings and recommendations in a report entitled A Proposed Nationwide Natural Disaster Warning (NADWARN) System.

The general NADWARN goals of the proposed NADWARN System are:

1. To make effective use of existing technology and of existing facilities of all participating Government agencies.

2. To apply available techniques and facilities to minimize inadequacies found in existing facilities and operations.

3. To extend the most effective practices of the present warning systems to all areas.

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1. "Weather Bureau Survey Team Report of Palm Sunday Tornadoes of 1965," U.S. Department of Commerce, Washington, D.C., 1965.

4. To provide for the distribution of all warnings, including those for additional types of hazards, as advancing technology permits.

5. To encourage and assist the individual, the community, and responsible governmental agencies to design and implement pre- paredness plans for effective response to natural disaster warnings.

6. To provide a single authentic channel between the warning agency and the public for the receipt of natural disaster warnings and for the denial or verification of rumors.

he specific objectives of the proposed NADWARN System are:

1. To improve natural hazards detection capabilities through expansion of the national weather radar network and the improvement of weather, river, seismic, and tidal observing capabilities.

2. To provide prompt and reliable dissemination of natural disaster warnings to every radio and television station, newspaper, and federal and state agency within the United States, as justified by the nature of the hazard and the population of the area, through establishment of a comprehensive nationwide natural disaster warning communications system.

3. To provide positive alerting directly to the general public through the use of sirens and by making use of special equipment being developed for national emergency warnings through radio or television.

4. To provide assistance to local communities in preparing com- munity warning plans and to assist them further by participating in preparedness seminars, provision of publications, films, speakers, etc.

onsidering now the specific objective of the proposed NADWARN System in :lation to the warning system elements shown in Figure 1:

:TECTION AND WARNING

iese would primarily be the function of the responsible warning agency and :nce not of much general interest outside the sphere of those interested in ie particular scientific discipline involved. One particular aspect, however, iy be of interest at this time: This is the "self-help" type of organization) essential for warnings in connection with the short-fuse type of disaster— irticularly tornadoes and flash floods.

Because of the rather limited and narrow path of most tornadoes, one of the major problems would be that of warning the specific small segment of the population or area involved, without needlessly disturbing the normal routine of sometimes hundreds of thousands of people in adjacent areas. For this reason, a "Tornado Watch"[1] would be first issued for the purpose of alerting larger areas, sometimes encompassing 20,000 to 30,000 square miles and covering time periods as much as two to six hours in advance. A "Tornado Warning," on the other hand, would not be issued until an actual tornado has either been sighted or definitely detected by radar. A definite warning would then be issued for areas in the path of the tornado.

Cooperative reporting networks of interested citizens, state and local police, etc., would comprise a vital segment in this detection process. The initial Tornado Watch would serve to alert the network to be on the lookout for funnel clouds and to report such occurrences immediately to the designated Weather Bureau Office. A major problem would be that of keeping such voluntary co-operators interested, alert and active, especially in areas that may not experience a tornado occurrence over a period of several successive years. A much more intensified effort in this respect has been recommended, including frequent revision and updating of various instructional leaflets, brochures, pamphlets, etc.

Similarly, in those areas where flash floods frequently occur, a voluntary type of self-help warning system would be established. A local agency having around-the-clock staffing would be selected and agree to assume the warning responsibilities. The Weather Bureau would provide information and organizational assistance in establishing the necessary network of reporting observers. The Weather Bureau would also furnish critical rainfall values, which may indicate an imminent flood threat, and keeps these updated on the basis of current conditions. In addition, if the specific area is under surveillance of a weather radar, the warning official would be alerted whenever the radarscope indicated the probability of heavy rains over critical areas. Less than 90 such cooperating flood warning networks are currently in existence; at least 500 additional are needed within the next three to five years.

COMMUNICATIONS

The responsible detection and warning agency would have little direct communications with the governmental and public recipients. This would be particularly true with respect to the general public. Almost complete reliance would be placed on the assistance of the mass dissemination media. The cooperation of radio and television stations is absolutely essential in communicating warning,

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1. Formerly designated as "Tornado Forecast"— changed to "Watch" beginning with the 1966 tornado season.

ticularly with regard to the short-fuse type of warnings such as tornadoes,
ish floods and tsunamis (immense tidal waves caused by submarine earth move-
it or volcanic eruption).

: Survey Group highly recommended that continued dependence be placed on the
is dissemination media and on their willingness to continue to cooperate to
: fullest extent. Accordingly, major emphasis would be placed on the require-
.t for communicating warnings, to the mass disseminators. In examining
.hods currently in use, the Group noted that present facilities consist of a
erogeneous patchwork of various and sundry communications facilities and
tial networks.

was therefore considered that the first requisite for a nationwide natural
aster warning system was for a single primary communications network capable
immediately reaching every community having either a daily newspaper or a
al radio or television station. For this purpose, the Group recommended the
ablishment of a natural disaster warning teletypewriter network for trans-
ting verbatim "hard copy" of disaster warnings for public dissemination. In
ect, this is an extension of the local teletypewriter networks now available
some 90 communities and adjacent areas. Currently, these serve only about
percent of the area of the United States.

s network would also be used on a 24-hour-a-day basis for distributing
ther and hydrologic data and forecasts. In addition to insuring the instant
diness of the network (without requiring periodic tests) for the distribution
hazard warnings, this practice would provide around-the-clock weather service
about 2,900 additional communities. Arrangements have also been made for
nsmitting Office of Civil Defense attack warnings on the entire network, if
 when they are required.

KUP COMMUNICATION AND EMERGENCY POWER

 communications lines and power lines so essential for the distribution of
ings are themselves vulnerable to the hazards for which the warnings are
ied. Therefore, it would be imperative that emergency power facilities be
ilable, not only for continued essential communication but also for continued
ration of the radars and other instrumental equipment so vital in the detec-
 and processing of information essential to the warnings.

insure reliability of communications to the public during disasters, there
: be emergency backup. Backup facilities should extend from warning offices
:he mass media; to federal, state, and community officials with emergenc;
)onsibility; and to schools, hospitals, and other essential facilities where
:e are concentrations of people. Backup facilities are needed in case of
:r failure, which occurred—for instance—in New Orleans during Hurricane
;y.

As the first of three types of backup, the Survey Group proposed the extension
of the continuous VHF radio transmissions already proven in operation by the
Weather Bureau at New York City, Chicago, and Kansas City. VHF radio trans-
mission facilities should be extended to all cities of 100,000 population or
greater where there is an ESSA office. The Group also proposed that pretuned
VHF receivers be provided by the Federal Government to agencies, establishments,
and officials essential to the warning process.

The Office of Civil Defense currently operates the National Warning System
(NAWAS), a comprehensive party-line network of telephone circuits connecting
National Warning Centers with State and local Civil Defense Offices, police
stations, etc., in nearly 800 communities. NAWAS could be extended to any
number of additional communities. The Weather Bureau offices, which also are
connected to this system (at least one in each state), have found it valuable
for transmitting weather warnings directly to officials to adjacent counties,
and especially valuable for obtaining feedback information on emergency action
that has been taken on tornadoes and other severe weather situations. The Survey
Group recommended that NAWAS be extended to every ESSA office with local warning
responsibility and that the circuits be extended to additional communities as
feasible.

Participation of amateur radio operators, Citizens' Band Units, and Citizens'
Radio Service stations in the provision of temporary emergency communications
during and after natural disasters have greatly assisted warning agencies and
public authorities in coping with the twofold need to disseminate public infor-
mation and to communicate with each other when ordinary facilities have been
rendered inoperative. The Group recommended that the great assistance that can
be rendered by these communications groups be recognized in community prepared-
ness plans as part of the backup communications facilities.

POSITIVE ALERTING DEVICES

The value of quick and positive alerting, both of the mass media and the general
public, has been dramatically demonstrated in a number of instances. The almost
total lack of such facilities was a very important contributing factor in the
high death toll of the Palm Sunday tornadoes. The Group highly recommended the
following three alerting procedures.

Teletypewriters at radio and television stations are generally located in the
newsrooms, which may be several doors removed from the studio. Especially on
weekends, holidays, or at night, only one employee, usually an announcer, may
be on duty (as was the case with many stations during the Palm Sunday tornadoes).
Without some means of alerting within that employee's sight or hearing, he may
not be aware of an emergency message until some time after its transmission.

A simple and inexpensive positive alerting device, which utilizes teletypewriter
transmission lines and rings a bell and/or flashes a light, is available. It

.hould be installed in all mass media offices and appropriate public agencies.
t can attract immediate attention of the broadcaster to an urgent natural
.isaster warning being transmitted by a warning agency.

'eans also are needed for alerting the general public to the fact that natural
isaster warnings are being broadcast or are imminent. The most common method
onsists of outdoor sirens, preferably with a distinctive signal indicating a
atural disaster. Some communities in areas with high tornado potential have
lready developed plans for sounding such sirens to alert those who may not
therwise be aware of warning information. The Weather Bureau currently can
irectly trigger the sirens in only two communities--Minneapolis, Minnesota and
hreveport, Louisiana. This feature was credited with saving a number of lives
n Minneapolis suburbs early last year. Similar procedures should be established
or all areas subject to the short-fuse type of disasters.

n ideal system of alerting through radio and television would include a means
f transmitting an alerting signal and/or turning on receivers automatically.
he National Industry Advisory Committee of the radio-television industry is
eveloping such a positive alerting AM/FM/TV signaling system for use in a
ational attack emergency. It envisions a device within the receiver that would
eact to a signal transmitted by a broadcast station. The device would energize
e loudspeaker of the receiver to receive the warning message. This positive
lerting system would also meet the needs for natural disaster warnings and
ould be utilized for that purpose as soon as it is available.

ith provision of the communications facilities and procedures outlined above,
e primary NADWARN communications system would be as shown in Figure 3, and the
ackup system as shown in Figure 4.

:TION

itensive campaigns directed toward educating the public and developing pre-
iredness plans are highly essential in any program aimed at assuring appropriate
:tion response with respect to natural hazard warnings.

.rst and foremost is the need for standardized and well understood terminology.
.e Group found that widely varying terminology is used in warnings and fore-
.sts. Some 10 different terms, such as "forecast," "warning," "bulletin,"
atch," "statement," "advisory," etc., are now used. It is essential that
andardized terminology be adopted so that the same words always mean the same
ing with regard to any natural disaster warning, and that they evoke similar
sponse from the public. The language of such warnings should be readily under-
andable, and the warnings should be communicated to the public without change
 modification in their prescribed format.

ny states and communities in hurricane areas have developed well-organized
eparedness plans. Several communities have also developed plans for other

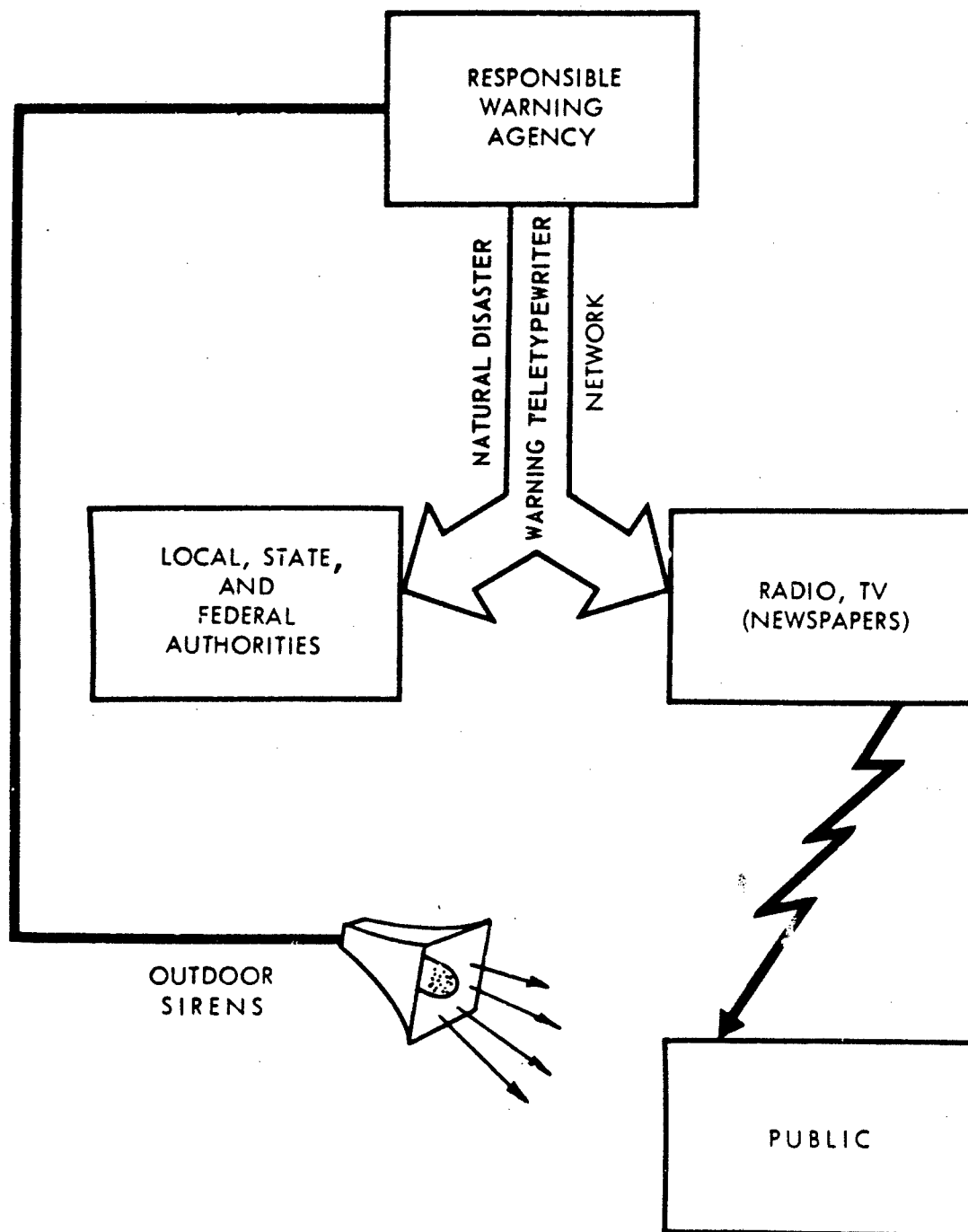# PRIMARY NATURAL DISASTER
WARNING COMMUNICATIONS SYSTEM

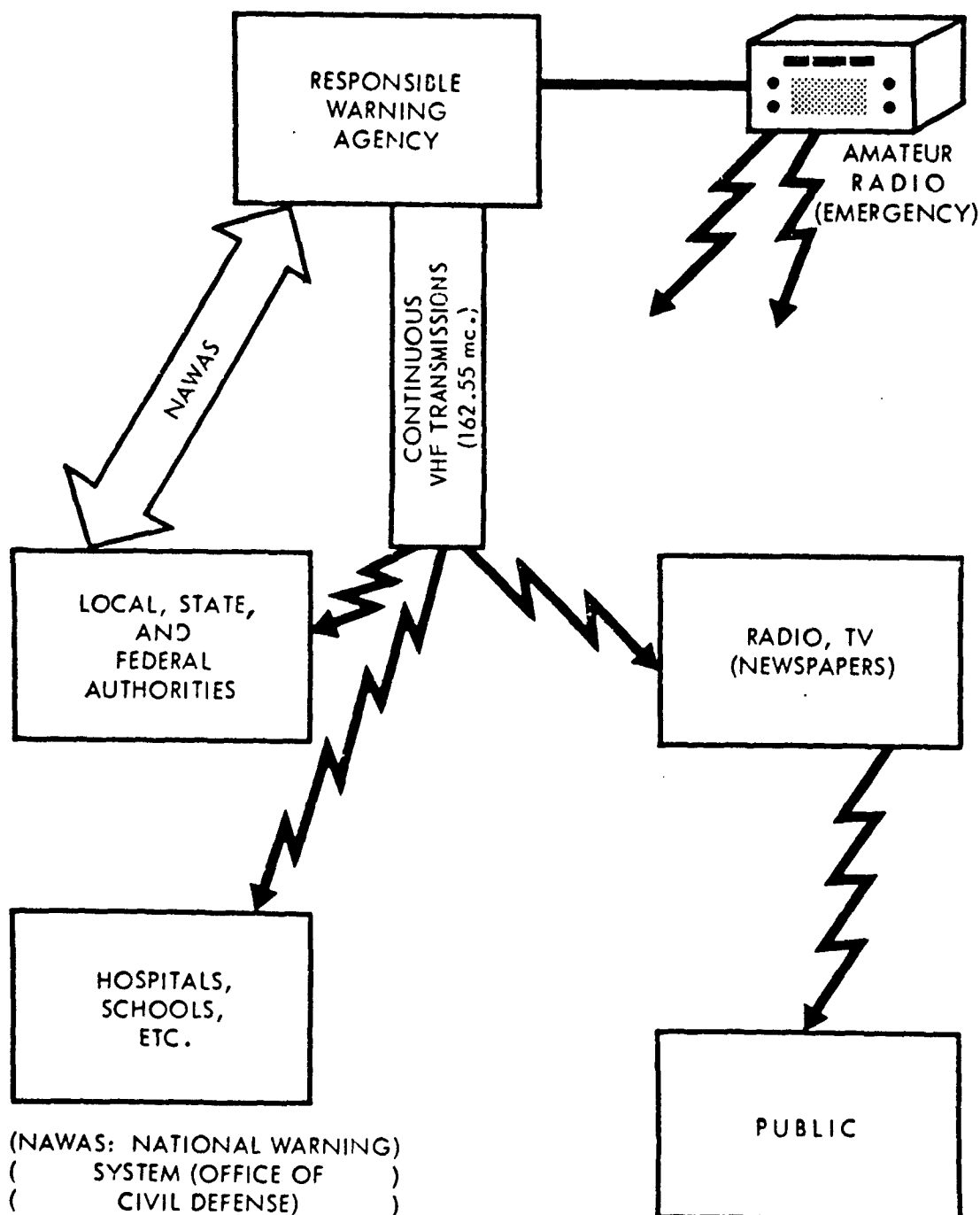FIGURE 3

BACK-UP NATURAL DISASTER
WARNING COMMUNICATIONS SYSTEM

(NAWAS: NATIONAL WARNING)
(SYSTEM (OFFICE OF   )
(CIVIL DEFENSE)   )

FIGURE 4

hazards, but many have no preparedness plans for coping with any natural dis-
aster. The Federal Government should take the initiative to assist communities
and states to develop and maintain complete and effective plans for all types
of natural disasters.

Natural disaster information pamphlets, brochures, and audio and visual material
should be continually revised, updated, and given the widest possible distribu-
tion. The continued cooperative assistance of mass media, so freely given in
the past, and of schools and community groups, is essential in carrying out this
program.

In the case of tornadoes, flash floods, and tsunamis, there is little time for
the public to refer to pamphlets and published rules for precautionary action.
Many of those who heard the Palm Sunday (1965) tornado forecasts and warnings
weren't certain what steps to take; many had no feeling of urgency. All such
warnings, therefore, should either include or be immediately followed by infor-
mation on appropriate actions to be taken by the public to save lives and
property.

The inclusion of "action" suggestions is equally important in connection with
normally "slower-fuse" types of disasters such as hurricanes, storm surges and
main stem floods, etc. In such cases, and also in connection with tsunamis,
evacuation or removal to higher ground may be ordered. This is generally the
responsibility of state and local agencies and officials. Close cooperation is
required between such officials and the responsible agency (as defined earlier
in this paper) to insure that the action ordered is appropriate to the antici-
pated developments.

FEEDBACK

Provisions for the immediate feedback of information through amateur radio and
from the active volunteer reporting networks to the responsible agency are en-
visioned in the use of the NAWAS circuit. Feedback is also provided as a con-
sequence of cooperation with the local and state officials as mentioned above.

An additional and very important source of feedback is the information obtained
through the conduct of post-disaster surveys. The Palm Sunday survey mentioned
earlier in this report was of particular value in this respect. Equally im-
portant is the occasional conduct of surveys by behavioral scientists. The
Group strongly recommended that such surveys be undertaken in connection with
designated natural disaster occurrences.

BENEFITS OF THE PROPOSED NADWARN SYSTEM

Even if a perfect warning system could be devised, it would still be impossible
to eliminate all loss of life and property damage caused by natural disasters.
Some people will always ignore or discount warnings, and some, including the

aged, children, and the hospitalized, may be unable to act unassisted. Build-
ings and installed property can be protected only to a limited extent. Disaster
sometimes strikes too quickly for people to take cover, or too violently for
available cover to afford protection.

Natural disasters will always exact a toll, but its study and analysis indicate
that an improved system will lead to significant benefits. Community prepared-
ness programs, including public information materials and dissemination of infor-
mation, are an integral part of the NADWARN System. It is estimated that the
NADWARN System:

1. Could reduce deaths from tornadoes, hurricanes, floods,
and tsunamis by as much as one half.

2. Could reduce economic losses by more than $100 million a year.

3. Will reduce post-disaster impact confusion.

4. Will provide, as a benefit to every community served by a
local-area radio station or daily newspaper, 24-hour weather
service comparable to that currently available to only 224
communities.

The present system for dealing with natural disasters is inadequate in detection,
dissemination of warnings to many sections of the country, and in community
warning programs. The proposed NADWARN System was designed to improve all
natural disaster warning procedures and practices on a nationwide basis. Im-
plementation of this system is entirely within the capabilities of existing
technology and the current state of the art, the system is sufficiently flexible
that it can take advantage of advancing technology and the experience gained
with each year's operation.

IMPLEMENTATION

Implementation of the proposed NADWARN System was proposed in three phases
(Figure 5) on a priority basis consistent with the magnitude and importance of
the hazard threat, population density, and currently available facilities. Each
of the three phases could, of course, be accomplished in one or more years.

Implementation during Phase I is directed primarily toward a broad, balanced
warning service improvement program with particular emphasis on "Tornado Alley"
and adjacent areas. In Phase II, the areas of primary emphasis include the
peripheral remainder of the tornado area, remaining states in the hurricane area,
the northeastern states, and the Pacific Northwest flood area. Implementation
should be completed in Phase III with the inclusion of the southwestern con-
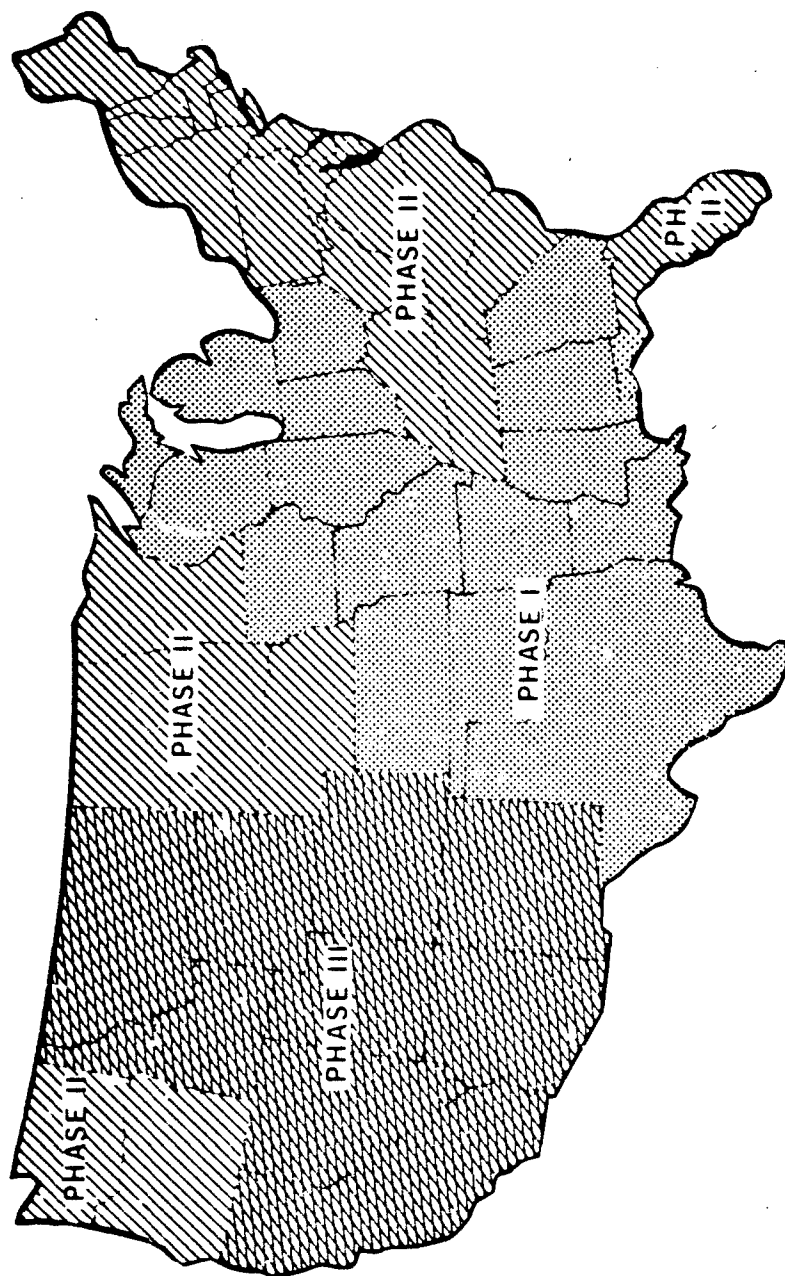terminous United States, the intermountain region, Alaska, and Hawaii.

IMPLEMENTATION

figure 5

ARCH

Group was instructed to confine its research efforts to the development of
stem capable of early implementation within the current state of the art
existing terminology. Under the circumstances, research as such, was out-
its terms of reference. "~vertheless, it was able to identify problems
e solution through research and development would materially advance the
bilities of our warning system. Among the techniques and capabilities
h would markedly improve warning are:

1. <u>Tornadoes and Severe Thunderstorms</u>:

   a. Methods for positive identification of tornadoes by
   radar or by other means, and identification of thunderstorms
   with tornado-forming pr~ential.

   b. Improvement of tornado forecasting on a time-scale of
   about six hours.

2. <u>Hurricanes</u>:

   a. Improvements in forecasting the formation and motion of
   hurricanes to periods beyond 12-24 hours.

3. <u>Flash Floods</u>:

   a. Development of a quantitative precipitation measuring
   device for use with radars.

   b. Development of an alarm-type river gage.

4. <u>Seismic Sea Waves</u>:

   a. Development of a deep-ocean tide recorder.

   b. Improved methods of forecasting the heights of the
   seismic sea wave.

5. <u>Storm Surges</u>:

   a. Improved methods of forecasting heights of storm surges
   and their effects on coastal facilities.

6. <u>Earthquakes</u>:

   a. A method for earthquake prediction.

   b. Improved assessment of seismic risks, and of the effect
   of earthquakes on structures.

DISCUSSION OF PAPERS ON PUBLIC IMPACT
Lewis M. Killian*

A number of years ago I used to get a laugh when people would ask me what my
research interests were, and I would say, "Disaster research and race relations."
They would say, "What's the difference?" There is something prophetic about
that now, in that civil defense and civil disorder seem to be both coming under
the same tent for consideration. Reminiscencing again I think back to some 10
or 15 years ago when disaster research, as it is so often called, was in its
infancy. I think particularly of a conference I went to. The preoccupation
at that conference was how to prevent the American people from engaging in
wild panic at the first warning of a civil defense emergency. In fact, the
United States Civil Defense Director had recently written an article in which
he characterized the American people as the most panic prone people in the
world and there was a great deal of talk of this sort.

I am struck by the contrast in the discussion today. In fact, we've been ask-
ing the question all afternoon, "How can you scare people sufficiently to get
them to do something!" I think that our observations over the past 10 years
have certainly indicated that the latter question might be more appropriate
than the question that was asked for awhile, "How can we prevent panic?",
which was supposed to be such a problem. I might raise the question, however,
as to whether even "how can you scare people?" is really the right question
for one to ask.

I'm not going to discuss the papers in the order in which they were given.
We've heard a description of what seems to be a very fine, comprehensive,
state civil defense organization and plan. We've seen particularly that
although it is justified by the threat of a civil defense emergency, the
organization is able to learn from the experiences that it has in peacetime
disasters, not all of them natural. Then we've heard a description of what
promises to be a very effective warning system. I am going to again go back
to my earlier theme in suggesting that maybe warnings of riots might also be
included in your system but since the Community Relations Service has been
taken out of the Department of Commerce I guess you don't have to worry about
that! Let the Justice Department develop a riot control warning system! But
in all of this, in listening to these two very excellent reports on excellent
systems, the comments that I have to make relates to what was missing. This
provides the tie-in with two earlier papers. We certainly get a picture of
dedicated "emergency specialists," particularly in the persons of these two
gentlemen. I think we can imagine that they have around them fellow emergency

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*Dr. Killian is Chairman of the Department of Sociology, Florida State University.

specialists who have the same concern and dedication that they have. But we don't get a picture of the many, many other people that may be involved in their activities, or that hopefully would be involved--the people who are supposed to be warned.

Now I'm not going to deal just with the broad concept of "the public", but with the many different levels of people who would be encompassed in Mr. Quarantelli's four types of organization: emergency specialists who I'm going to call here professionals; people who in a sense are part-time professionals who have latent disaster related jobs; volunteers; and then people who, so far as we know, have no conscious relationship to the whole business of civil defense. Now there are several questions that we can ask about these various people. I think we can think of them in terms of motivation.

Hence, I would wonder about General Asensio's organization--what sustains the professional members of his organization in the day-to-day performance of what Mr. Nehnevajsa has described as a socially unrewarding task. Even more so, what sustains people who are not as professional? How much interest do many of these people have who, by virtue of their other jobs, also have civil defense responsibilities; how genuine is their interest, how continuous is it, or how much is this a very latent job to which they pay little attention? I would wonder also how much of a problem of turnover General Asensio faces in his own professional staff? And then what is the attitude of the volunteers, many non-professional, on the community level, to this very excellent plan.

I think we also derived, from the discussion of the warning system, some indications that in many cases you have a good bit of apathy toward or disregard of one of the excellent plans for warning if it has not been worked out on the local level where people simply haven't thought about what they are going to do. In effect, with these professional plans and, organizations, how much involvement or non-involvement outside the corps of emergency specialists do we really have? Do we know how much we have and do we know how to get it?

It also has been suggested that as we expand the corps of emergency specialists; as we increase the expenditure for a stable organization; we may lead to a "Let George do it" attitude on the part of these many other people and increase the apathy or over-confidence, which leads to less involvement. In effect, I think of two big questions that I am not sure we have been asking in relation to civil defense. One of them relate to Mr. Withey's talk, namely: In view of the complexity of arousing adaptive behavior in response to threat, can we count on this as a basis for civil defense planning? In effect, is it worth the effort to try to find out how to develop an optimal sort of arousal in the general public?

he other question follows directly from this: "Is there any point in count-
ng on any large segment of the public, as, I am using the term loosely here,
ctive participants in the civil defense effort or should we regard them
ssentially as passive participants on whom we count only for such activities
hat they may engage in spontaneously and that they may be directed to engage
n by emergency specialists who themselves are prepared for the eventualities
hich arise?"

hat is a little loose, I grant you. Certainly I don't rule out the fact that
ome level of arousal, at least of getting their attention, would be necessary
o getting the sort of direction we might get from the emergency specialist.
ow, here, to try to tie this together, is what I am suggesting and I'm cer-
ainly not making a brief for this; I'm trying to be provocative. It seems
o me that from the time we have thought of civil defense planning we have had
mplicitly this kind of model: A slim budget, a small corps of planners, people
ike General Asensio and his staff, and then the hope that somehow or another
e could get enough arousal of the type that Mr. Withey was talking about to
et volunteer participation on the part of the public, both in terms of the
trategic warning phase and in terms of the tactical warning phase. I would
uggest that we might consider (and here we come back to that business of
oney) a very different model.

or instance, when we talk about military defense we don't depend certainly on
his model for motivation. The Army does not depend upon scaring enough young
en about the threat of war to get them to enlist into the Army. Yet this is
ssentially what we are doing in civil defense and I think there have been a
ot of implications here today, particularly in Mr. Withey's report, that we
eed to look not at producing attitudes, but at producing behaviors, which will
n turn lead to adaptive behaviors in emergencies.

suggest that we need to look at some other models. One of these being that
ld problem, which greatly resembles the problem that we face here today--
otivating soldiers, airmen, sailors to train in peacetime for a war that we
ope will never come. This applies even more to another model that has many
ears of experience. Mr. MacNamara apparently doesn't think it has been too
uccessful, but some of the other officers that have been interested think
ifferently. This is the even more difficult problem of motivating military
eseivists to participate in this sort of preparedness activity. Today they
re sitting around wondering, "what are we doing?" because we have a very
erious crisis and about every two weeks we hear that we really are quite
nnecessary. It is rather amazing that the units hang together the way many
f them are doing in view of the blows that have been dealt their morale, but
pparently a lot of them are doing it.

Then Mr. Withey implied, although I wasn't too clear just exactly which model he had in mind, that there are a number of other models that we might look to for ways of getting the sorts of behavior that will prepare people to participate significantly in civil defense emergencies. In conclusion, it seems to me his implication is: 1) that this would limit the role of the general public; secondly, that it would rely much less exclusively on arousal of response to threat than we have been thinking of; and third, and quite obviously, it would require a great deal more money. Whether it comes from the federal level or state level is another question. But, again, we certainly do not try to run our military defense establishment on the basis that we can scare enough people we can get cheap volunteers to run the thing. I submit that there is a lot of evidence that we don't take civil defense seriously on the national level because this is essentially the way we run it.

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